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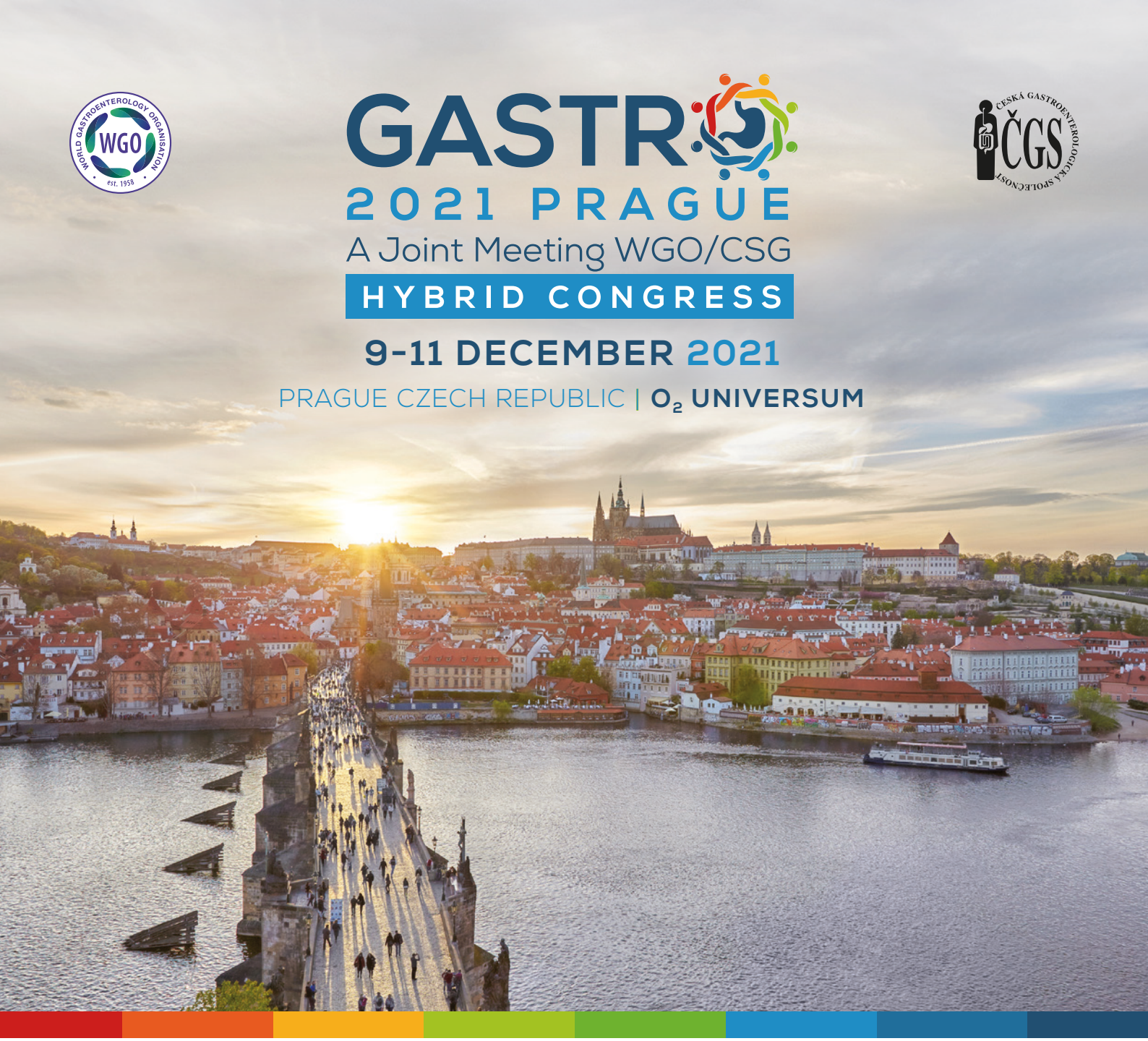

# ABSTRACT BOOK

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# GASTRO 2021 Prague
# Abstract Book

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# FREE PAPERS

## ENDOSCOPY

### Musculoskeletal injuries in Tunisian endoscopists: Prevalence and risk factors

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**Aims:** The aim of our study was to evaluate the prevalence of musculoskeletal injuries among Tunisian endoscopists and to determine the different risk factors.

**Methods:** A questionnaire including the following elements was sent to endoscopists: sex, age, weight, height, number of years of endoscopy, number of colonoscopies and upper endoscopies per week, number of hours of endoscopy per week, use of an optical endoscope, realization of interventional gestures, practice of a sports activity, presence of muscle pain as well as its location, the diagnosis and the different therapeutic and ergonomic strategies.

**Results:** One hundred and twelve endoscopists were included. The mean age was 40.7 years [27-69]. Muscle pain was noted in 85% of gastroenterologists. The most frequent locations were the back (74%) and the neck (55%). Twenty patients were forced to stop endoscopy for a mean period of 7 days [1-180 days]. In uni-variate analysis, muscle pain was associated with age >34 years (0.014), senior status (p=0.01), number of years of practice >10 years (p=0.023), number of colonoscopies greater than 5 (p=0.025), use of an optical endoscope (p=0.007), and number of hours spent on endoscopy greater than 6 (p= 0.05). In multi-variate analysis, only the use of an optical endoscope (p=0.01) and the number of years of practice >10 years (p=0.05) were associated with muscle pain. Concerning the severity of the injury, the associated factors were age >34 years (p=0.04), senior status (p=0.01) and a sedentary lifestyle (p=0.01). In multi-variate analysis, the two independent factors were senior status (p=0.04) and sedentary lifestyle (p=0.01).

**Conclusion:** According to our results, age, workload, use of an optical endoscope, and sedentary lifestyle were the most associated with muscle pain as well as its severity. An ergonomic strategy at work and the practice of a sporting activity are essential to prevent these disorders.

**Keywords:** endoscopists, Musculoskeletal injuries

## The value of routine terminal ileal biopsies for the investigation of diarrhoea

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**Aims:** Diarrhoea is a common referral to both gastroenterology and colorectal departments. The British Society of Gastroenterology guideline advises all patients presenting with chronic diarrhoea to have terminal ileoscopy and biopsies in addition to random colonic mucosal sampling. The aim of our study investigates the value of terminal ileum (TI) intubation and biopsies alone in excluding inflammatory bowel disease (IBD).

**Methods:** Data were retrospectively collected over a 1-year period (2018–2019) of all patients undergoing colonoscopies for chronic diarrhoeas in our major district general hospital. Demographic data, endoscopic and histological findings of the colon and TI were examined and analysed.

**Results:** 140 patients with a mean age of 57 years (19–84) underwent a colonoscopy (M: F; 1:2.3). 92 (66%) had random colonic biopsies taken of which 15 patients (16%) were diagnosed with IBD.

The TI was successfully intubated in 40/140 (28.6%) patients, of which 32/40 (80%) had colonic biopsies concurrently.

Macroscopic abnormality in the TI was detected in 5 cases, all of which were biopsied and 3 of them indicated IBD on histology. Interestingly all 3 patients (100%) had concurrent colonic biopsies that also showed IBD related inflammations.

None of the patients had a diagnosis of IBD confirmed on TI intubation alone, where colonic biopsies were either not done or were negative for inflammations.

**Conclusion:** TI intubation can be tricky, time-consuming and incurs higher risk of perforation than ordinary colonoscopies alone. Our study demonstrated that TI intubation adds little diagnostic value in excluding IBD for patients with symptoms of diarrhoea as long as colonic biopsies are taken. We propose that diarrhoea is a symptom of the colon and most IBDs cases that present with diarrhoea should have detectable changes on histological analyses of colonic mucosa.

**Keywords:** Terminal ileum, Biopsy, IBD, Colon, Intubation

## Evaluation of upper GI bleeding by Rockall score

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Rockall score (RS) is a tool developed by an English team in 1996 to establish the prognosis of hemorrhagic recurrence in patients in order to allow an early return home. We illustrate through this work our experience with the application of this score in practice in patients with upper GI bleeding (HDH).

**Materials and methods:** This is a descriptive and analytical prospective study conducted in our department, over a period of one year from July 2020 to July 2021, the evaluation of patients after the bleeding episode was done during hospitalization and remotely by phone calls. Data were collected then analyzed using SPSS for 20.0. The Mann-Whitney test was used to compare medians, and simple and multiple linear regression were performed, with a retained significance level of 0.05.

**Results:** The study included 72 patients with HDH, the median Rockall score was 4.48[3-6]. The evolution was marked by a hemorrhagic recurrence in 25.2% of patients. Comparison of the two groups: Group 1 (who did not recur) and group 2(who recurred) showed a superiority of the median of RS in group 2 which was 5.28[ 4-8] compared to 3.47 4[1.5-4.5] in group 1 with p= 0.002. In group 2, the predictive factors for hemorrhagic recurrence were the presence of signs of shock and the presence of endoscopic signs of recent bleeding with (OR = 1.897 – IC95% (0.948-1.679), p < 0.001) and (OR = 1.765 – CI95% (1.231-2.923), p = 0.003) respectively. Sensitivity: 54.14% – Specificity: 76.19% – PPV: 44.4% – VPN: 84.2% – AUC: 0.741.

**Conclusion:** The application of this prognostic score is important in the clinical practice to allow an adequate selection of patients most at risk of hemorrhagic recurrence in order to be well armed during the clinical monitoring period.

## Hybrid Argon Plasma Coagulation in the ablation treatment of Barrett´s esophagus – 24 months results

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**Aims:** As an alternative to radiofrequency ablation (RFA), combined use of argon plasma coagulation with prior submucosal injection (hybrid APC) had been used successfully for ablation of dysplastic or residual intestinal metaplasia (IM) in Barrett´s esophagus (BE). Our study aims to analyze 24 months follow up results of hybrid APC in BE.

**Methods:** Single center study included patients with BE with dysplasia either without visible lesion or with visible lesion after prior endoscopic resection for ablation of residual BE. The extent of BE was limited to maximal 5 cm length. Hybrid APC (ERBE) was done during sedated endoscopy up to 3 sessions in 2-3 months intervals. Follow up by endoscopy with biopsy was regularly performed in 6 months intervals.

**Results:** From 25 included patients, 20 patients (mean age 60 years, 80 % male) were available for analysis 2 years after intervention. In 5 (25 %) patients previous endoscopic resection of visible lesion with dysplasia or early cancer was done. Mean 1.5 hybrid APC procedures were performed per patient to get optimal endoscopic result. In 24 months, histologic absence of dysplasia was achieved in 19/20 (95 %). Endoscopic and histologic absence of IM was achieved in 18/20 (90 %) and 15/20 (75 %) respectively. In 4 patients nonvisible IM was detected by biopsy, while a small visible abnormality without confirmed IM was seen in 2 patients. The main procedure related symptoms were pain and dysphagia in 60 % and 15 % respectively. Stricture developed in 1/20 (5 %). No perforation or bleeding occurred.

**Conclusion:** Hybrid APC seems an effective, safe and easy method in the ablation of short segment BE either in nonvisible dysplasia or residual IM after endoscopic resection. However, repetitive procedures and follow up are required.

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**Keywords:** Barrett´s esophagus, Endoscopy, Ablation, Endoscopic resection, Argon plasma coagulation

## Esophageal Variceal Band Ligation – number of sessions required for the obliteration of varices

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**Aims:** Esophageal variceal band ligation (EVBL) is an effective therapy to prevent upper gastrointestinal bleeding by rupture of esophageal varices. However, the frequency and number of sessions indicated for their eradication are not established in the guidelines. Thus, the objective of this study was to determine the number of EVBL sessions required for the obliteration of esophageal varices.

**Methods:** Retrospective and monocentric study, which included all adults with cirrhosis who underwent EVBL between August 2017 and January 2021. Patients with small esophageal varices and gastric varices were excluded.

**Results:** A total of 187 individuals were included in this study. The majority (80.8%) were male, with a median age of 62 years old (interquartile range 56-69). The most common causes of cirrhosis were alcohol (58.8%) and hepatitis C virus infection (15.5%). The majority (53.7%) of the patients had decompensated liver cirrhosis (Child-Pugh B or C). During the study period, 473 procedures were performed, the majority (65.3%) as primary prophylaxis. In 42.2% of the individuals, eradication of esophageal varices was achieved, on average after 2.6 sessions. However, it should be noted that in 6 (7.6%) patients, more than 5 EVBL sessions were needed. In individuals with hepatocellular carcinoma, the obliteration of esophageal varices was significantly less likely to occur (25.8% vs. 45.5%; p=0.042), requiring a greater number of sessions (3.0 vs. 2.5; p=0.039). Similarly, patients on secondary prophylaxis required significantly more sessions to the eradication of esophageal varices (3.5 vs. 2.2; p=0.001).

**Conclusion:** Esophageal variceal ligation was a safe and well-tolerated procedure. Most patients need 3 EVBL sessions to achieve the eradication of esophageal varices. However, the number of sessions increases significantly in the presence of hepatocarcinoma or in the case of secondary prophylaxis. Therefore, clinicians should be more interventional in this group of individuals.

**Keywords:** Esophageal variceal band ligation, Esophageal varices, Cirrhosis

## Establishing Teaching Endoscopy by Remote Mentoring (TERM) in Oceania

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**Aims:** We wish to report on the organization and implementation of a remote mentoring project in Oceania.

**Background:** Oceania, excluding New Zealand and Australia, consists of 21 nations with a combined population of 10 million, separated by vast distances and scattered over 100 million square kilometers. There are few practicing endoscopists. Those who do practice endoscopy need assurance that their skills are of a high standard, and have a need for both maintenance of skills and upskilling. Ongoing support from geographically remote mentoring organisations of necessity tends to be intermittent, and expensive to deliver in both time and financial terms. We propose a method of remote mentoring using web-based observation which may help meet the educational needs of practitioners in remote areas.

**Methods:** The core of the remote mentoring system is a live endoscopy feed and a simultaneous endoscopy room view from the trainee's site. This, and audio communication between trainer and trainee, is fed over Zoom to the trainers. The trainee needs to have basic skills and the trainers need to be skilled in endoscopic training. Support of the trainers and trainee's hospital, health system, medicolegal and regulatory authorities is a necessity as is a support team with expertise in information technology.

**Results:** The primary outcomes will be change in DOPS (Direct Observation of Endoscopy Skills), measured at baseline and over the mentoring period, and patient safety, which will be tracked by telephone follow up of patients 30 days post procedure.

**Conclusion:** We have established the methodology for remote mentoring of endoscopy in Oceania. The results will be applicable to delivery of endoscopic education in all areas. In addition, the methodology will allow education and support to continue even if travel restrictions occur due to future pandemics or climate concerns.

**Keywords:** Endoscopy, mentoring, virtual, training, education

## An unusual complication of EUS-guided gastroenteroanastomosis

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A 65-years-old patient with generalized breast cancer was examined for signs of upper gastrointestinal obstruction. The cause of endoscope-impermeable duodenal stenosis was malignant abdominal lymphadenopathy. In December 2020, the patient underwent endoscopist ultrasound-guided gastroenteroanastomosis (EUS-GEA) using a 20 mm long HotAxios stent (Boston Scientific) which led to an immediate remission of the problems and full resumption of oral intake. The correct position of the stent in the small intestine has been documented endoscopically and radiologically. In March 2021 the patient complained of dyspeptic problems, and the performed gastroscopy showed the correct passable gastroenteroanastomosis with two loops of small intestine. In May 2021, there is a gradual development of anorexia, vomiting, diarrhea, and the CT of the abdomen shows possible communication of GEA with the large intestine. In June 2021, vomiting with an admixture of stercoral contents occurs and control gastroscopic examination shows the communication of gastroenteroanastomosis with the large intestine as an atypical but described complication of GEA. We extract the metallic stent and close the gastric orifice of the anastomosis endoscopically with an OVESCO clip and endoloop leading to an immediate remission of vomiting. Due to the ongoing oncological treatment, the patient in the meantime has a regression of lymphadenopathy and thus a release of duodenal obstruction, so we are not introducing a new GEA. Normal oral intake is gradually restored and the patient continues oncological treatment.

## Chronic mesenteric ischemia mimicking gastric cancer

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A 67-year-old Caucasian male presented with chronic postprandial abdominal pain, loss of appetite and hypochromic microcytic anaemia. His medical history was noteworthy for chronic ischemic heart disease, myocardial infarction and chronic lower limb ischemia with a recent acute femoropopliteal occlusion. His medication included antiplatelet agents and proton pump inhibitors (PPI).

Esophagogastroduodenoscopy (EGD) revealed a wide ulcer in gastric body and antrum with a necrotic base. Biopsy demonstrated high grade epithelial dysplasia and a negative *H. pylori* staining. Endoscopic ultrasound showed hypoechoic infiltration of mucosa and submucosa. Based on these results, gastrectomy was recommended.

PPI dosing was escalated and a month later, just prior to the planned surgery, a repeat EGD was performed. Signs of ulcer healing were present and histology showed no signs of dysplasia. Due to these findings and the patient's comorbidities, a conservative approach was chosen. However, further weight loss and persistence of symptoms prompted us to perform us to another EGD which showed two new ulcerations distally, histologically without sings of dysplasia, and focal patches of pale mucosa resembling tissue ischemia. CT angiography demonstrated a significant narrowing in the origin of the celiac trunk (TC), the superior (SMA) and the inferior mesenteric artery (IMA).

An endovascular approach was unsuccessful. Open surgery revascularization was performed including aorto-bifemoral and SMA bypass and IMA reimplantation. The surgery resulted in a significant clinical improvement and weight gain. Follow-up EGD showed a longitudinal scar with no ulcer.

In summary, we report a case of chronic mesenteric ischemia resulting in a refractory gastric ulcer mimicking gastric cancer that was successfully treated with revascularization surgery.

**Keywords:** Chronic mesenteric ischemia, Chronic ischemic gastritis, Ischemic ulcer

## Development of a new Endoscopic Classification Score System for Serrated Adenomas in the Colorectum – The ESCO study

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**Aims:** There have been several attempts to establish an optical classification for colorectal polyps, yet prediction to distinguish between sessile serrated lesions (SSL), conventional adenomas and hyperplastic polyps remains uncertain. The aim of this study was to develop and validate a new endoscopic classification (ESCO) based on narrow band imaging (NBI) to differentiate between said polyp classes.

**Methods:** The study was conducted in two phases. First, a regression analysis was conducted using a previously created polyp database in order to extract features being positively correlated with SSL histopathology. The most important SSL features were NICE-type 1 class, localization of the polyp, polyp size, flat polyp morphology, presence of a mucus-cap, and dark spots on the polyp surface. These features then were used by expert endoscopists to form a new classification, called ESCO. In a second phase, we validated the ESCO-classification by a group of 5 medical students, 5 gastroenterology fellows and two expert endoscopists, using a library of 90 polyps.

**Results:** ESCO-based prediction for SSL polyps showed a sensitivity ranging from 60% to 88%, specificity from 77% to 92%, positive predictive values from 59% to 81% and negative predictive value (NPV) from 82% to 94%. In the high confidence setting accuracy of optical predictions ranged from 73.6% to 82.2%. Experts consistently reached the best results and performed significantly better compared to trainees regarding accuracy values (p=0.016).

**Conclusion:** We formed a new clinical classification system using optical and epidemiological criteria to predict the histopathological diagnosis of colorectal polyps including SSL. In a first validation, we showed that students, fellows and experts could achieve good accuracy for optical diagnosis of SSL, using the new ESCO-classification. The NPV for SSL in the expert group was >90%. Further trials in real-time setting are needed to continue validation of the classification.

**Keywords:** Polyp, Colon, serrated, classification, optical

## Antireflux mucosectomy (ARMS) and resection and plication (RAP): promising procedures for the management of recurrent gastroesophageal reflux disease after prior nissen fundoplication or transoral incisionless fudoplication (TIF)

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**Background:** GERD is a common digestive problem in the United States. The standard treatment is PPIs. There are side effects to long-term PPI use; therefore, there is a recent shift towards anatomical correction. Nissen Fundoplication and TIF are established procedures. However, the flap valve tends to become loose over time.

**Aims:** To evaluate the safety and efficacy of ARMS with or without suturing in patients who had previous fundoplication that has become loose.

**Methods:** We report a series of patients, at 3 hospitals, with GERD who have had prior Nissen Fundoplication or TIF, in which symptoms have recurred. A standardized procedure for mucosectomy was performed and an approximate 180 to 210-degree area was resected. Approximately, 1 cm of the distal esophagus and 2 cm of the cardia were resected along the lesser curve. ESD was performed in 6 patients, EMR in 6 patients. Suturing was used in 4 patients with Hill Grade 3 valve.

**Results:** Twelve patients were enrolled in the study. 5 had prior TIF and 7 had prior Nissen Fundoplication. All patients underwent the ARMS procedure. Of these patients, 7 patients had a Hill Grade 3 Valve and 5 patients had Hill Grade 2 valve. Follow-up endoscopy was performed at 6-12 weeks. At follow up, 7 patients had a Hill Grade 1 valve and 5 patients had a Hill Grade 2 valve. All patients had improvement in symptoms. 4 patients developed dysphagia, 1 of these required dilation. The remaining patients' dysphagia resolved spontaneously. 7 patients had pain that resolved within one week. 2 patients had pH testing more than 8 weeks post-procedure and the Demeester Score was normalized in both. The follow-up was 6-32 months.

**Conclusion:** In this pilot study, ARMS appeared to be an effective option in patients who had prior fundoplication with recurrent GERD symptoms.

**Keywords:** GERD, Antireflux Mucosectomy, Fundoplication, TIF

## Endorotor and EFTR: novel use in the resection of malignant tissue

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**Background:** Endorotor is a non-thermal mechanical endoscopic mucosal resection system that is currently FDA approved for removal of benign neoplastic or pre-malignant tissues in the gastrointestinal tract. Published literature is limited on this device; however, the main complications associated are bleeding/hemorrhage, perforation and post-polypectomy syndrome. Endoscopy Full Thickness Resection (EFTR) is another novel and minimally invasive procedure that involves complete therapeutic resection of lesions that may be treatment resistant or difficult to resect.

**Aims:** To evaluate the use of EndoRotor in the resection of malignant tissue after failed ESD/EMR and endoscopic full-thickness resection techniques.

**Methods:** This is a report of a series of patients that underwent Endorotor and EFTR procedures at two general hospitals in the Chicagoland area. The procedures were performed by an advanced endoscopist who has received training in both procedures.

**Results:** Of the 11 cases requiring EndoRotor intervention, 7 involved resections of malignant tissues throughout the GI canal. After follow-up evaluation, no complications were observed, and no pathological dysplasia was noted. Of the 12 cases that underwent EFTR resection, 36% of the resections were performed on adenocarcinoma specimens. Successful resection was achieved, and no complications were noted during follow-up.

**Conclusions:** In the pilot study, Endorotor and EFTR appeared to be a safe and effective in the resection of malignant tissue found throughout the GI tract.

## Artificial intelligence and capsule endoscopy: a binary convolutional neural network model approach for the automatic detection of ulcers and erosions

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**Introduction:** Ulcers and erosions are frequent findings in capsule endoscopy (CE) exams. CE is a key element in the follow up of patients with Crohn's Disease (CD). Nevertheless, reading capsule endoscopy exams is time-consuming and prone to errors. Convolutional neural networks (CNN) are artificial intelligence tools with high performance levels in image analysis. This study aims to develop a CNN-based model for automatic identification of ulcers and erosions in CE images.

**Methods:** The development of the CNN was based on a database of CE images. This database included images of normal small intestinal mucosa or non-erosive findings and images of enteric ulcers and erosions. For CNN development, 19340 images (16175 normal mucosa, 3165 ulcers or erosions) were ultimately extracted. Two image datasets were created for CNN training and testing.

**Results:** The network was 96% sensitive and 98% specific for detection of ulcers and erosions in the small bowel, providing accurate predictions in 98%. The CNN had a frame reading rate of 149 frames per second.

**Conclusion:** The developed algorithm accurately detects ulcers and erosions in CE frames. The development of these automatic systems may allow to improve the diagnostic yield of CE for these lesions and increase the efficiency of the reading process of CE exams.

**Keywords:** Capsule Endoscopy, Artificial Intelligence, Deep Learning, Inflammatory Bowel Disease, Small bowel.

## Deep learning and device-assisted enteroscopy: automatic detection of pleomorphic gastrointestinal lesions in device-assisted enteroscopy using convolutional neural networks

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**Introduction:** Device-assisted enteroscopy (DAE) allows deep exploration of the gastrointestinal (GI) tract, enabling tissue sampling and the application of endoscopic therapy. Convolutional Neural Networks (CNN) are a multi-layer artificial intelligence architecture with high performance levels for image analysis. The application of these automated algorithms for detection of lesions in DAE has not been explored.

**Methods:** 4 CNNs were developed based on 72 DAE exams. A total of 11205 images in the GI tract was included, 2535 images containing protruding lesions (polyps, epithelial tumors, subepithelial lesions and nodules), 1435 containing blood or hematic residues, 1395 images containing angioectasias and 450 images containing ulcers/erosions. The remaining images showed normal mucosa (n=5390). A training dataset comprising 80% of the total pool of images (n=8964) was used for development of the network. The performance of the CNN was evaluated using an independent validation dataset (20% of total image pool, n=2241).

**Results:** The CNN protruding lesions model automatically detected GI protruding lesions with a sensitivity of 97.0%, a specificity of 97.4%, positive and negative predictive values of 94.6% and 98.6%, respectively. The CNN blood model automatically detected blood/hematic residues with a sensitivity of 95.8%, a specificity of 97.6%, positive and negative predictive values of 91.4% and 98.9%, respectively. The CNN angioectasias model automatically detected angioectasias with a sensitivity of 88.5%, a specificity of 97.1%, positive and negative predictive values of 88.1% and 97.0%, respectively. Furthermore, the CNN ulcers/erosions model automatically detected ulcers/erosions with a sensitivity of 100%, a specificity of 96.4%, positive and negative predictive values of 96.8% and 100%, respectively. The CNN analyzed images at a rate of approximately 239 frames per second.

**Discussion:** We developed a pioneer AI algorithm for automatic detection of pleomorphic lesions in the GI tract during DAE. The development of these tools may enhance the diagnostic yield of device-assisted enteroscopy.

**Keywords:** Device-assisted enteroscopy, Small bowel, Deep Learning, Artificial Intelligence, Middle gastrointestinal bleeding

## Upper gastrointestinal bleeding: comparison between the Rockall score and the Glasgow-Blatchford score

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We use several scores for the stratification of the risk of upper gastrointestinal bleeding and its complications: including the Glasgow-Blatchford (GB) and Rockall scores.

**Our aim** is to evaluate the use of these prognostic scores and to compare them in terms of predicting recurrence.

**Methods:** This is a prospective, descriptive and analytical study conducted between April 2020 and July 2021. We included patients over 18 years of age who presented with upper gastrointestinal bleeding, we excluded only patients lost to follow-up. We collected the clinical-biological and endoscopic data.

**Results:** 72 patients were included, mean age 56.5 ± 6.8. The sex ratio: 1.28.40 patients required a transfusion (54.7%) and 14 patients needed intensive care (19.1%). The prevalence of recurrent bleeding was 25.2% of patients. GB Score – using a cut off of 0 has good sensitivity and good VPN: Sensitivity: 100% – Specificity: 9.52% – VPP: 26.9% -VPN: 100% – AUC: 0, 54. The Rockall Score using a cut-off of 4 has good specificity: Sensitivity: 54.14% – Specificity: 76.19% – PPV: 44.4% – VPN: 84.2% – AUC: 0.741. In multivariate analysis, the two scores were predictive of the need for transfusion with a slight superiority of the GB score (OR = 1.9 – 95% CI: [1.245-2.67], p <0.001 compared to the Rockall score OR = 1, 02 – 95% CI: (0.802-12.30), p = 0.04. They are also predictive of recurrence: Glasgow score (OR = 2.2 – 95% CI: [1.5-9.3], p= 0.002), Rockall score (OR = 4.2 – 95% CI: [2.4-25.67], p = 0.008). However, neither score was predictive of the need of intensive care

**Conclusion:** The Glasgow-Blatchford score help to identify with greater sensitivity patients for whom an endoscopy may be postponed. However, the two scores have a

## The case of iatrogenic separation of esophagus and its intussusception into the pharynx after removing of partially covered self-expanding metallic stent

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**Aims:** To describe case of management of iatrogenic separation of esophagus and its intussusception into the pharynx after removing of partially covered self-expanding metallic stent (SEMS) in patient with esophagal carcinoma.

**Results:** An 83-year-old male with cancer of the lower part of the esophagus (pT4N1M2 adenocarcinoma G2) presented with symptoms of dysphagia. On 02.08.2021 a partially closed SEMS 20 x 120 mm was installed in another clinic. At the control examination a complete tumor invasion of the proximal stent crown was observed. The stent was removed and the doctor noted a partial demucosis of lower part of the esophagus. The patient underwent a feeding tube and CT scan that showed signs of pneumomediastinum.

After 21 days the patient came to our clinic with complaining to respiratory failure occurs by a foreign body.

During examination was noted intussusception of the esophagus into the oral cavity with necrosis of the distal part of the invaginate over a length of 10 cm at the level of 20 cm from the incisors. The distal end of the invaginate has the appearance of a tubular structure. A hole was marked in the duplicate of the mucous membrane through which the feeding tube is inserted into the stomach at 20 cm from the incisors on the right wall. Demucosis of the esophagus with partial or complete separation and intussusception into the pharynx is most likely corresponds to this endoscopic picture.

The necrotic part of the esophagus was resected to prevent asphyxia. An attempt to reposition the invaginate was not effective. The feeding tube was removed, and a gastrostomy was surgically placed.

The patient was discharged for outpatient treatment.

**Conclusions:** The clinical case emphasizes that only fully coated SEMS should be removed. It is important to follow the stent removal technique and the correct management of patient.

**Keywords:** iatrogenic injury, separation of esophagus, esophagal carcinoma, endoscopy

## Quality of colonoscopy in Lynch Syndrome

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**Aims:** Colonoscopy reduces both the incidence and mortality of colorectal cancer (CRC) in patients with Lynch Syndrome (LS). We intend to evaluate the quality indicators and the high-risk lesion and CRC detection rate in this group of patients.

**Methods:** We retrospectively analysed a cohort of patients with LS of the Familiar Risk consult, without prior colon surgery and that were submitted to at least 2 colonoscopies between january 2012 and june 2021. We evaluated quality indicators from the latest colonoscopy and from the colonoscopy preceding detection of high-risk lesions/CRC by colonoscopy and the incidence of high risk lesions and CRC.

**Results:** A total of 148 patients (58% female) were submitted to 619 colonoscopies (median 4). Considering the more recent colonoscopy of each patient, 92% (n=136) had adequate bowel preparation (BBPS >=6) and 34.5% had excellent preparation (BBPS=9). In 1% of the exams, cecal intubation was not achieved. The polyp, adenoma and serrated lesion detection rates were 24.3%, 20.3% and 1.4%, respectively.

During follow-up (619 colonoscopies), we identified 30 (4.8%) high risk lesions (>10mm and/or high-grade dysplasia/serrated lesions with dysplasia) and 10 CRC (1.6%). In this group of patients, 31.3% of the former colonoscopies (n=10) had inadequate bowel preparation (BBPS<6) and in 5% of them cecal intubation was not achieved. The mean time between colonoscopies was 17 months and 9 (22.5%) patients did not meet the recommended surveillance period (n=5 surveillance interval >24 months; n=4 inadequate bowel preparation/without cecal intubation and surveillance interval >3 months)

**Conclusion:** Optimization of colonoscopy has a special role in LS and in the definition of endoscopic surveillance. Additional studies are needed to further understand the impact of colonoscopy quality in the long term.

**Keywords:** colonoscopy, lynch syndrome, quality

## A computer-aided optical classification of colorectal polyps including serrated adenomas

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**Aims:** Computer-aided models allow precise optical diagnosis of neoplastic and nonneoplastic polyps based on their optical features. However, automated differentiation of serrated adenomas from hyperplastic polyps and adenomas still proved to be challenging. We aspired to develop a computer-aided model (CAM) for optical classification of colorectal polyps into hyperplastic polyps (HP), adenomas (AD) and serrated adenomas (SA).

**Methods:** This was a prospective study at a university hospital in Germany. A total of 250 patients received colonoscopy. All detected polyps were resected. Histological polyp diagnoses were used as reference standard. A total of 489 video sequences of 327 polyps were recorded. Of these, 191 videos were used for development and training of a CAM. The CAM corresponds to a region proposal deep neural network based on the RetinaNet architecture trained for recognizing the three classes. After CAM was developed, 100 polyps which were not used in the baseline model were presented to CAM in order to test the program. CAM-based polyp predictions were compared with the histopathological results in order to evaluate the test quality.

**Results:** A total of 100 polyps (of these 50% AD, 35% HP, 15%SA) were used in the CAM test phase. Accuracy regarding the prediction of SA was 86.0%. Sensitivity and negative predictive value (NPV) were 6.7% and 85.9%. Specificity and positive predictive value (PPV) were 100% respectively. CAM-based sensitivity and NPV the prediction of AD was 96.0% and 81.8%. Specificity and PPV for the prediction of AD was 18.0% and 53.9%.

**Conclusion:** Artificial intelligence is not yet capable of differentiating serrated adenomas from other polyp classes sufficiently. Computer assisted optical characterization already shows good sensitivity regarding adenomas. However CAM approaches face major challenges with respect to classifying serrated lesions. More video data is probably needed in order to refine the CAM prior of capturing SA sufficiently.

**Keywords:** computer, polyp, classification, automatic, colon

## FUNCTIONAL DISORDERS

### Eating behavior and intestinal permeability in obese persons with irritable bowel syndrome

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**Purpose:** The purpose of the study is to identify the features of the dietary preferences and the permeability of the intestinal wall for the development of patient-oriented approaches to the management of IBS patients with obesity.

**Materials and methods:** 52 patients with IBS were interviewed to assess food preferences. Determination of the intestinal permeability level was carried out with an assessment of the zonulin level in feces by the method of enzyme immunoassay. Patients with the body mass index (BMI) ≥25 kg/m$^2$ were included in the main group, patients with a BMI <25 kg/m$^2$ were included in the comparison group.

**Results:** The dietary preferences of patients with IBS against the background of overweight or obesity differ from those ones with normal weight by a higher intake of sweet, flour products and fruits. When choosing food, the respondents of the main group are more guided by their own dietary habits, nutritional value of the product and family budget. They are less committed to the advice of a specialist than people with normal weight. The degree of satisfaction with the variety and amount of food consumed in both groups did not differ significantly. The average concentration of zonulin in feces of patients with IBS in the main group was significantly higher than in the group with normal weight (248.0 [176.5; 658.0] ng/ml versus 186.5 [130.9; 223.4] ng/ml).

**Conclusions:** Further studies on the diet of the patients with IBS are required, both to establish the characteristics of the dietary preferences' influence on the symptoms of IBS and weight dynamics, as well as to study the effect of adipose tissue on the eating behavior of patients. Long-term follow-up may establish the need to change the current standard dietary regimens for patients with IBS, and the development of the algorithms for the patient-oriented diet therapy.

**Keywords:** irritable bowel syndrome, obesity, food preferences, eating habits

## Concomitant Therapy for 7 days achieves better eradication for *Helicobacter pylori* compared to Standard Triple Therapy: a randomized controlled trial

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To compare the efficacy of a Concomitant Therapy (CT) with Standard triple therapy (STT) in patients who test positive for Urea Breath Test (UBT) for *Helicobacter pylori* presenting to a tertiary care hospital. Total 156 patients from both genders and aged between 18-65 years, who test positive for Urea Breath Test for *Helicobacter pylori* were involved in this study. These patients were then separated into two treatment groups randomly. Patients in Group A were given amoxillin 1000 mg, clarithromycin 500mg and rabeprazole 20mg, all two times a day with metronidazole 500mg TDS for 07 days. Patients in Group B were given rabeprazole 20mg plus amoxicillin 1 g and clarithromycin 500mg twice daily for 07 days only. Among 156 patients presenting with *Helicobacter pylori* infection, mean age was 38.96 + 9.28 years ranging from 18 to 65 years. Almost 85% of patients were below the age of 50 years. While about 15% of them were above 50 years of age. The female population was slightly more with 50.6% proportion as compared to male gender who was 49.4% in this study. Epigastric pain and upper abdominal discomfort found in 91 (58.3%) cases, retrosternal and epigastric burning 31 (19.9%) cases, bloating in 21 (13.5%) and epigastric fullness was present in 13 (8.3%) cases. Eradication of *Helicobacter pylori* was achieved in 106 (67.9%) patients. Efficacy of Concomitant Therapy was significantly higher than Standard Triple Therapy (79.5% vs 56.4% respectively; p=0.002). Concomitant Therapy found to be more effective in males (p=0-010) then females (p=0-067). Concomitant Therapy has shown much greater eradication rate as compared to Standard Triple Therapy and can be safely used as first line therapy against *Helicobacter pylori* infection. Though females were found to have higher eradication failure with Concomitant Therapy which requires further studies on larger scale.

**Keywords:** Concomitant Therapy, *H. pylori* eradication, Dyspepsia

## Association of dietary patterns and esophageal multichannel intraluminal pH-impedance examination

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**Aim**: To analyse association between dietary patterns and number of gastroesophageal refluxes detected with oesophageal multichannel intraluminal pH-impedance (MII).

**Methods**: Subjects referred to esophageal pH-impedance examination were invited to participate in the study (https://rscf.ru/contests/search-projects/19-76-30014/). Data about usual diet was collected with the use of food frequency questionnaire (Nutrilogic, Russia). Dietary patterns were assessed in accordance to "Healthy Eating Index" for the following groups of products: grains, fruits, vegetables, dairy products, meats, fats and confectioneries. The results are shown as a quotient of dividing the actual values by the recommended daily allowance. Ohmega recorder (Laborie, the Netherlands) and 2pH-6 impedance catheters (MMS, the Netherlands) were used to perform MII. Spearman rank R was used to analyze correlation between the number of gastroesophageal refluxes (GERs) detected with esophageal MII and dietary patterns.

**Results**: Data of 40 consecutive patients (12 – with gastroesophageal reflux disease (GERD), 28 females, age (Mean±SD): 52.2±12.9 y.o.) were analyzed. Mean energy value of the diet was 2302±1391 kcal/day. Dietary patterns for main food groups were as follows (relative values, in comparison with Healthy Eating Index): grains 1.4±0.7, vegetables 1.1±0.7, fruits 0.8±0.9, dairy products 0.6±0.6, meats 1.7±1.0, fats 0.6±0.8, confectioneries 0.3±0.5. Mean total number of GERs was 43.8±24.4 per day, acid GERs 26.2±20.5 per day. Pattern of dairy products consumption correlated with total number of GERs (Spearman $R=0.47$, $P<0.05$), number of weak-acid GERs ($R=0.49$, $P<0.05$), number of non-acid GERs ($R=0.62$, $P<0.05$). Pattern of confectioneries consumption correlated with the number of high GERs (at 17 cm above lower esophageal sphincter): $R=0.47$, $p<0.05$. No correlation between MII and other dietary patterns was identified.

**Conclusion**: Dietary patterns may have impact on the number and type of gastroesophageal refluxes. The obtained results may be a basis for larger comparative trials and for diet modification in patients with GERD.

**Keywords:** GERD, gastroesophageal reflux, dietary patterns, multichannel esophageal intraluminal pH-impedance

## Are ten water swallows really necessary to obtain reproducable results of high-resolution esophageal manometry?

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**Aim:** To compare reproducibility of repeated measurements of esophageal motility after 5 water swallows within a study

**Methods:** Patients referred for HREM to assess oesophageal motor function were enrolled. Solid-state 36-channel 10 Fr catheter (Unisensor AG) and Solar (MMS) software were used. Minimum 10 water swallows by 5 ml each were obtained. Two operators independently assessed the results of examination. Records of swallows were divided into 2 series by 5 measurements each. These series were compared by key metrics: integrated relaxation pressure (IRP), distal contractile integral (DCI), distal latency (DL), and contractile front velocity (CFV). Non-parametric statistics was used to compare the results.

**Results:** We enrolled 46 men and 68 women, age (mean±SD) 48.8±11.5 y.o. Of them, 52 patients had GERD, 25-different types of achalasia and 37 had no oesophageal disorders. The inter-observer agreement reached 98%. No significant differences were found between the IRP, DCI, DL and CFV in 2 series of measurements.

Table 1. Values of series of measurements of the main studied metrics of esophageal motility

| | **Measurements 1 to 5 Mean±SD** | **Measurements 6 to 10 Mean±SD** | **P** |
|---|---|---|---|
| DCI, mmHg x cm x sec | 869.2±881.7 | 889.7±878.7 | 0.66 |
| IRP 4, mmHg | 12.1±7.2 | 12.0±6.8 | 0.52 |
| CFV, cmxsec | 5.7±4.4 | 5.8±4.5 | 0.41 |

**Conclusion:** No significant differences between two series of HREM measurements are found. According to the results, 5 water swallows may be enough to obtain sufficient details on standard evaluation of oesophageal motility. Reduction of time necessary for standard examination may allow additional time for functional tests (solid food swallows, RDC or MRS).

**Keywords:** high-resolution esophageal manometry, reproducibility, HREM

## Ultrasound as a gold standard in diagnosis of pylorostenosis in pediatric patients

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The aim of the study was to evaluate the importance of ultrasound examination in pediatric patients with suspected pylorostenosis.

63 patients, including 25 girls and 38 boys were referred for US examination in years 2014-2019 due to vomiting, abdominal distension and significant weight loss suggesting pylorostenosis. The age of the patients ranged from 3 to 8 weeks. All ultrasound examinations were performed with linear probes (L12-4Mhz and 7.2-18MHz). The length of the pyloric canal and the thickness of the muscle layer were assessed. Patients were fed before or during the examination.

In 52 patients US confirmed pylorostenosis. The thickness of the muscle layer of the pyloric canal was 5-9 mm (mean 7 mm), while the length of the pyloric canal was 17-30 mm (mean 23.5 mm). Ultrasound did not reveal pylorostenosis in 11 patients. In this group, in 7 patients the pyloric canal had the correct dimensions – the thickness of the muscle layer of the pyloric canal was 2-4 mm (average 3 mm) and the length of the pyloric canal was 8-13 mm (average 11 mm). In 4 remaining patients the thickness of the muscle layer of the pyloric canal was 3-4 mm (average 3,5 mm), and the length of the pyloric canal was 10-23 mm (average 16,5 mm), which indicated the dyskinesia of the pyloric canal. Based on the ultrasound examination result and clinical symptoms, 52 patients were qualified for surgery.

Ultrasound examination is the gold standard in the diagnosis of pylorostenosis. It is characterized by 100% sensitivity and specificity and does not require verification in other imaging techniques. It is a safe method of choice and the duration of the examination is relatively short, which is extremely important in pediatric patients.

**Keywords:** pylorostenosis, gastrointestinal tract, ultrasound

## GASTRIC ONCOLOGY

### Comparison of colorectal cancer burden in: opportunity for sharing lessons and expand partnership in health care between South Africa and Brazil

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Colorectal cancer (CRC) is now ranked among the three most frequent cancers globally. As the level of human development is increasing, so is the CRC burden in South Africa (SA) and Brazil (BR). Monitoring CRC epidemiological trends is important to ensure responsive policies informing public health detection and control. The study compared CRC incidence and mortality patterns in SA and BR.

**Method**s: National-level prevalence, incidence, mortality data was obtained from the WHO cancer database (GLOBOCAN 2018) and extracted for the two countries.

**Results**: CRC is the top four and five leading cancer in SA and BR, respectively. In 2018, the number of new CRC cases in South Africa 6 937 cases (6.5% of all cancer cases[MH1]) while in Brazil there were 51 783 (9.3% of all cancer cases). The CRC incidence rate in SA was 1.1 times higher in males than in females, while in BR, CRC rate was 1.07 times higher in females than in males (females: 10.2, males: 9.5 per 100 000). The incidence cumulative risk was slightly lower in in South Africa (1.03%) than in Brazil (1.2%) – The mortality cumulative risk was at 0.54% in South Africa and 0.60% in Brazil. The highest age-standardized incidence rate (ASIR) is observed in Brazil with 19.6 per 100 000 population compared to South Africa that reported 14.4. per 100 000 population. The age-standardized mortality rates (ASMRs) were above 10 per 100 000 population for both sexes in both countries.

**Conclusion**: Epidemiological variation in CRC between countries reflects differences in terms of socio-economic development. Noting that the CRC burden is increasing, there are opportunities for sharing lessons learned between developed and developing countries, to improve surveillance systems at sub-national levels.

**Keywords:** Colorectal cancer, South Africa, Age standardised incidence rate, Brazil, gastric oncology

## A Case Report on Medullary Carcinoma of the Colon Disguised as an Intra-abdominal Abscess

***Navkiran Randhawa*** *(Franciscan St. James Hospital, Olympia Fields, USA)*

**Aim:** Carcinoma of the colon has a wide spectrum of presentations. We report a patient who presented to our hospital with medullary carcinoma of the colon that mimicked an intra-abdominal abscess.

**Case:** Our patient is a 55-year-old female with a past medical history of right sided breast cancer status post lumpectomy and chemo/radiation therapy in 2012, hypertension, hyperlipidemia who presented with sudden onset sharp, 10/10 abdominal pain in the lower quadrants of her abdomen. She denied any melena, hematochezia, changes in her bowel habits, fevers, chills, dysuria, cough, shortness of breath. She states she recently was treated with antibiotics for an intra-abdominal abscess. Her vitals were significant for a temperature of 101.3°F and HR of 113. Her labs were remarkable for leukocytosis at 13.6. A CT abdomen and pelvis demonstrated large rim-enhancing fluid collection in the right abdomen high suspicious for abscess or malignancy. The patient was started on antibiotics for possible intra-abdominal abscess. A CEA was found to be elevated at 7.7. The patient was prepped for a colonoscopy to examine the possibility of an intraluminal mass.

**Result:** The colonoscopy revealed an intraluminal mass with a biopsy confirming invasive medullary carcinoma of the colon. The patient underwent a laparotomy, open cholecystectomy, small bowel resection, hemicolectomy and primary anastomosis. As per the operative note, the tumor invaded into segment 4B of liver and gallbladder, prepyloric region of the stomach proximally and into the transverse colonic mesentery and anteriorly into the jejunum. Pathology revealed colonic medullary carcinoma, poorly differentiated invasive through muscularis propria with direct extension into mucosa of the gallbladder.

**Conclusion:** Medullary carcinoma is a rare colorectal neoplasm that typically manifests in the ascending colon. The purpose of this case study was to spread awareness of the different ways medullary carcinoma can present.

**Keywords:** Medullary Carcinoma of Colon, Colon, Cancer

## Photodynamic Therapy of Non-Surgical Esophageal Adenocarcinoma After Failed Endoscopic Submucosal Dissection (ESD)

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**Aim:** Photodynamic therapy (PDT) is a treatment utilizes a photosensitizer to localize a tumor. The photosensitizing drug is absorbed by tumor cells and then laser is introduced to activate the sensitizer to induce a photodynamic reaction resulting in destruction of the tumor cell. The aim of our paper is to examine the use of PDT in a 66-year-old patient with esophageal adenocarcinoma after a failed endoscopic submucosal dissection.

**Case:** Our patient is a 66-year-old male with a past medical history of coronary artery disease status post CABG, chronic kidney disease, hypertension, diabetes and obesity who presented to our facility with dysphagia to solids and liquids with a sensation of a foreign body in his esophagus for the past two months. An endoscopy revealed a nodule in the distal esophagus with biopsies being positive for adenocarcinoma. An endoscopic ultrasound revealed T1 carcinoma with suspicion of submucosal invasion. Due to his extensive past medical history, the patient was deemed not a candidate for esophagectomy. Thus endoscopic submucosal dissection (ESD) was performed. A post ESD biopsy revealed T1 carcinoma invading submucosa, extending to the cauterized margins. We then utilized photodynamic therapy (PDT)

**Result:** Repeat endoscopies were done at 1 month, 1 year and 18 months. The 1-year endoscopy revealed no evidence of malignancy and revealed inflammatory atypia bordering upon lower grade dysplasia not related to PDT. The most recent 18 month follow up revealed normal pathology with GERD.

**Conclusion:** This case revealed PDT as a treatment for a patient who was not a candidate for esophagectomy and failed ESD. PDT was able to successfully treat esophageal adenocarcinoma in this patient.

**Keywords:** Esophageal Adenocarcinoma, Photodynamic therapy, Endoscopic Submucosal Dissection

## Synchronous Gastric and Colon Cancer: A Unique Presentation

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**Aims:** Multiple primary cancers diagnosed within 6 months of each other is called synchronous. Diagnosis of two primary cancers at the same time is a rare entity. We present a patient who was diagnosed with primary gastric and colon adenocarcinoma during his hospital visit.

**Case:** Our patient is a 60-year-old male with no prior medical history who presented to the emergency room for hematemesis and epigastric pain without associated fever, chills or melena. Our patient was seen at a emergency room for nausea and vomiting 5 days prior. He was discharged with the diagnosis of viral gastritis. He stated his symptoms never resolved with hematemesis starting the day of admission. The patient had not seen a primary care physician in over 15 years. He denied NSAID use, history of alcohol use, use of anticoagulation or family history of cancer. His labs were remarkable for a hemoglobin of 7.9, hematocrit 23.5.

**Results:** The patient underwent an EGD and colonoscopy. The EGD showed non-bleeding, Forest class IIc gastric ulcer. Pathology revealed grade 3 adenocarcinoma with ulceration. A colonoscopy revealed multiple polyps throughout colon and rectal mass. The mass pathology revealed a grade 2 invasive adenocarcinoma of rectum with multiple tubular and tubulovillous adenoma polyps. Our patient is scheduled to follow up outpatient with the oncologist.

**Conclusion:** Synchronous gastric and colon cancer is a rare entity. Our patient presented primarily with upper gastrointestinal symptoms but was diagnosed with both, a primary colon and gastric cancer. Patients with symptoms of upper or lower tract origin should undergo early gastroscopy and colonoscopy.

**Keywords:** Colorectal Adenocarcinoma, Gastric Adenocarcinoma, Synchronous Cancer

## HEPATOBILIARY

### Awareness for Disease Among Anti-HCV Positive Patients

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**Aim:** We aimed to show the rate of awareness of patients who have HCV disease.

**Methods:** We defined awareness as a) the patient stating that he knows he has an Anti-HCV positive test result, b) finding the results of HCV RNA and/or HCV treatment in the database. In the first step of study, demographic and laboratory data of 866 patients who applied to Karabuk University Education and Research Hospital for any reason and were found to have positive Anti-HCV screening test between 2016 and 2019 were obtained retrospectively from the hospital database included in the study.

**Results:** It was observed that 453 of these patients had at least one HCV RNA test or HCV treatment in the digital database records. The demographic data of 163 patients for whom no further information could be found in the database, were tried to obtain by phonecall. As a result of the patient records or phone calls it was assumed that 93% of the patients were aware that they have the disease. Of 73 patients that could be reached by phone, 37 (51%) were aware of their illness. Aware patients were similar in terms of gender, but were younger than those who were not aware. (Mean age in the unaware group was 69.44 ± 15.21 years, while in the aware group was 62.68 ± 11.73, p=0.037).

**Conclusion:** It was assumed that 93% of Anti-HCV positive patients knew about the disease. However, it is thought-provoking that this rate was 51% in the phone interview. Probably patients hide their infections diseases (AIDS, tuberculosis or other contagious infectious disease) in order to avoid stigma, or the doctor-patient relationship is not adequately established. Since HCV is a treatable disease, it is necessary to raise awareness of doctors and patients in order to ensure that unaware patients can access treatments.

**Keywords:** Anti-HCV, awareness, Hepatitis C virus, epidemiology

## Is MRCP always a prerequisite for ERCP for management of gallstone disease?

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**Introduction:** Magnetic Resonance Cholangio-pancreatography (MRCP) is recommended if abdominal ultrasound scan (USS) does not detect choledocholithiasis but the bile duct is dilated and/or liver function test (LFT) results are abnormal and Endoscopic Retrograde Cholangio-pancreatography (ERCP) is recommended in diagnosed choledocholithiasis. However, there is currently no consensus on the best modality of investigating Common bile duct stones.

**Aim:** To evaluate the relevance of MRCP in patients presenting with gallstone disease.

**Method:** A retrospective analysis of a prospectively maintained database of patients who underwent cholecystectomy between May 2018-November 2019 was undertaken. A detailed review of patient case notes, radiological and endoscopic interventions were undertaken.

**Results:** In a total of 96 patients (male: female; 19:77), 94 patients had an abdominal USS and two had had computed tomography (CT) scan as their initial investigation.

40 patients underwent MRCP, the indications of which were worsening LFTs (57.5%) and/or USS/CT findings of abnormally dilated ducts or inconclusive scans (42.5%). 19 patients in our study cohort had proceeded to have ERCP. The USS of eight of those had already demonstrated abnormal ducts on USS but still went onto have MRCP before ERCP.

11 MRCPs out of 40 demonstrated abnormal ducts and 29 were normal. Out of the 29, 4 still went onto have ERCP.

The median waiting time for MRCP was 6 days (0-28 days).

**Conclusion:** With a waiting time of almost a week, the question arises whether the patients need MRCP before an ERCP if USS were to demonstrate abnormal duct dilatation. A significant number (14%) of patients who had a normal MRCP went onto have ERCP which questions the appropriateness and cost-effectiveness of performing both in patients presenting with obstructive jaundice as ERCP has both diagnostic as well as therapeutic benefits.

**Keywords:** MRCP, ERCP, USS, Gallstone disease

## Artificial Intelligence and digital single-operator cholangioscopy: automatic diagnosis and morphological characterization of malignant biliary strictures in digital single-operator cholangioscopy

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**Introduction:** Diagnosis and characterization of biliary strictures is challenging. The introduction of digital single-operator cholangioscopy (D-SOC) allowing direct visual inspection of the lesion and targeted biopsies significantly improved the diagnostic yield in patients with indeterminate biliary strictures. However, the diagnostic efficiency of D-SOC remains suboptimal. Convolutional neural networks (CNNs) have shown great potential for the interpretation of medical images. We aimed to develop a CNN-based system for automatic detection of malignant biliary strictures in D-SOC images.

**Methods:** Our group developed, trained and validated a CNN based on D-SOC images. Each frame was labeled as normal/benign findings or as a malignant lesion if histopathological evidence of biliary malignancy was available. Moreover, we evaluated the performance of the network for the detection of morphologic characteristics associated with biliary malignancy: tumor vessels, nodules, masses and papillary projections. The image dataset was split for constitution of training and validation datasets. The performance of the CNN was measured by calculating the area under the receiving operating characteristic curve (AUROC), sensitivity, specificity, positive and negative predictive values (PPV and NPV, respectively).

**Results:** A total of 11855 images from 85 patients were included (9695 of malignant strictures and 2160 of benign findings). The model had an overall accuracy of 94.9%, a sensitivity of 94.7%, a specificity of 92.1% and an AUROC of 0.988 in cross-validation analysis. The image processing speed of the CNN was 7 ms/frame.

**Discussion/Conclusion:** The developed deep learning algorithm accurately detected and differentiated malignant strictures from benign biliary conditions. The introduction of artificial intelligence algorithms to D-SOC systems may significantly increase its diagnostic yield for malignant strictures.

**Keywords:** Artificial Intelligence, Cholangioscopy, Biliary strictures, Deep learning, ERCP

## IBD

### The becoming of ano-perineal lesions in Crohn patients under biological treatment

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Through this work, we illustrate the evolution of these lesions by comparing patients before and after the beginning of biotherapy.

**Methods:** This is a retrospective analytical study carried out in our department between January 2015 and January 2021 including all patients receiving biological treatment for CD with APL. Demographic, clinical, therapeutic and evolutionary data were collected and studied using SPSS for 20.0

**Results:** Among 355 patients with CD, 45 patients were on biological treatment which 32 (71%) had APL. Among these 32 patients, sex ratio(W/M) was 1.9, mean age was 37 +/- 9.3. The type of anal involvement was as follow: 20 patients (75%) had anal suppurations, 7 patients (20%) had ulcerations and 5 patients (5%) had anal stenosis. In 5% it was an isolated anal Crohn's disease, in 15% it was intestinal disease with APL, in 31% it was colonic disease with APL. 25 patients (78%) were under Infliximab and 7 patients (21.8%) under Adalumimab. The number of patients with APL before treatment has significantly decreased after treatment with a p=0.002, with an improvement of APL in 20 patients (60%) of under anti-TNF agent.

**Conclusion:** In our study, anti-TNF agents allowed a better management and a favorable evolution of APL in most of our CD patients. However, to overcome the failure of anti-TNF in some of our patients, the availability of other biological molecules on the Moroccan market remains more than desirable.

## Immune response induced by SARS-CoV-2 vaccines in patients with inflammatory bowel disease under biologic therapy

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**Aims:** Patients with inflammatory bowel disease (IBD) were excluded from safety and efficacy phase III vaccine trials. Moreover, the rate of immunity to coronavirus in these individuals is currently unknown. This study was designed to assess the immune response induced by SARS-CoV-2 vaccines in IBD patients under biologic treatment.

**Methods:** All adult patients with IBD undergoing biologic therapy at a tertiary referral hospital who had already been vaccinated were invited to perform a serological test (BioPlex 2200 SARS-CoV-2 IgG Panel, BIO-RAD, USA). We excluded those with a previous diagnosis of COVID-19.

**Results:** A total of 76 patients agreed to participate in the study, the majority females (59.2%), with a median age of 53 years old (IQR 37-63). IBD diagnosis included Crohn's disease (76.3%) and ulcerative colitis (23.7%). The proportion of patients receiving anti-tumor necrosis factor (anti-TNF), vedolizumab and ustekinumab were 68.4%, 17.1% and 14.5%, respectively. This cohort included 63 (82.9%) fully vaccinated patients (61.9% Pfizer-BioNTech, 19.0% Moderna, 14.3% AstraZeneca, 4.8% Janssen). The seroprevalence of those who received only one dose was 75.0%, while full vaccination status was associated with a SARS-CoV-2 seroprevalence of 95.2%. Furthermore, most patients with complete vaccination scheme had anti-RBD antibodies >100U/mL (82.5%) and anti-S1 antibodies >100U/mL (73.0%). There were no association between biologic therapies and positive SARS-CoV-2 serology (anti-TNF 95.6%, vedolizumab 100%, ustekinumab 90.0%; p=0.665). Patients who received the Janssen vaccine had a significantly lower immune response (33.3% Janssen vs. 97.4% Pfizer-BioNTech, 100% Moderna, 100% AstraZeneca; p<0.001). No patient was diagnosed with COVID-19 after vaccination and no serious adverse event was observed.

**Conclusion:** Vaccination against SARS-CoV-2 seems to be safe and effective in IBD patients under biologic therapy. However, the Janssen vaccine may be less effective in immunocompromised individuals. Larger studies are needed to assess the safety and efficacy of vaccination in this group of patients.

**Keywords:** Inflammatory bowel disease, Biologic therapy, SARS-CoV-2 vaccine, SARS-CoV-2 seroprevalence

## Perianal lesions as first manifestation of Crohn's disease in pediatric population

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**Introduction:** Crohn's disease (CD) is classified as chronic inflammatory intestinal process, characterized by remitting and relapsing course. Approximately 25% of patients are diagnosed before age 20 years. Among children, 4% present before age 5 years and 18% before age 10 years. Typically, primary symptoms of Crohn's disease include abdominal pain, recurrent diarrhea, fever and weight loss. Perianal abscess may be the first presentation of CD in a healthy individual. MRI and transrectal US are established modalities in the assessment of perianal lesions, while transperineal ultrasonography (TPUS) is an alternative method. Our aim was to highlight the effectiveness of TPUS in the diagnosis of perianal lesions in pediatric patients with Crohn's disease.

**Materials and Methods:** Nine consecutive patients (6 male, 3 female) aged 12 to 18 were admitted to Gastroenterology Department between 2018 and 2020 and underwent imaging diagnostics due to prolonged pain in the perianal area that worsened when sitting. Transperineal ultrasonography examination with a high frequency 7-12 MHz linear probe was performed in each patient.

**Results:** Ultrasound examination revealed ano-rectal fistulas in 6 patients (4 male, 2 female). In 4 of these patients (2 male, 2 female) fistula tracts were draining perianal abscesses. Interestingly, in three patients (2 male, 1 female) both ultrasound and MRI failed to visualize fistulas that were clinically apparent (with external openings detected in physical examination). All of the patients were eventually diagnosed with Crohn's disease as a result of further clinical workup.

**Conclusion:** First manifestation of Crohn's disease may be non-specific. Ultrasound, including TPUS, is a non-invasive, well-tolerated modality for the evaluation of CD activity and its possible complications, in particular fistulas and abscesses. Due to lack of ionizing radiation the imaging technique is especially useful in pediatric patients, who will require repeated follow-up investigations.

**Keywords:** Ultrasound examination, Perianal fistula, Crohn's disease

## IBD Associated Surveillance Dysplasia Program: New integrated model – Royal Brisbane Hospital Update Year (Audit, summary, future directions and Literature review)

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**Aim:** The aim of the IBD dysplasia surveillance MDT is to improve the pathway for surveillance procedures, allocate resources appropriately and identify patients for research and trials.

**Methods:** The MDT was conducted by the clinical team, administrative and data managers. Cases were mainly referred from the prospective months booking database. Each case that is included in the monthly MDT meeting is discussed to ensure appropriate/consistent with guidelines. We collate the case with IBD database and risk calculator, assess and prescribe bowel prep, record outcome and communicate any changes, identify patients for studies and ensure we allocate patients to appropriate endoscopy lists.

**Results:** Over a course of 12 meetings conducted monthly a total of 356 cases were screened with 91 cases eligible of which 62 cases considered suitable in meeting inclusion criteria. The majority of these cases were UC (E3/E2) (n=56), Crohns (n=27), colonic IBD (n =7) and IBD-U (n=1). Family history not strongly represented. The majority of cases were deemed in the high-risk category for colorectal cancer (43/62). Previous Dysplasia cases were limited (n=2) There were 17 cases with PSC (of which seven were large duct). Interestingly the MDT meeting found ten new cases of PSC which were being worked up between IBD appointments and yet to have a hepatology referral or critical investigations. There were ten pouchscopy cases. There were a significant number of deferrals, cancellations and reassignments identified and implemented as a result of the MDT IBD surveillance meeting (n =16). We also identified significant bowel prep deficiencies in IBD dysplasia surveillance cases (n=18) and subsequent bowel prescriptions were made.

**Conclusion**: The IBD surveillance MDT is a clinically useful tool that demonstrates significant improvement in quality and procedure reallocation including those with challenging risk factors or those outside the evidence-based guidelines are appropriately monitored.

**Keywords:** IBD dysplasia, Surveillance

## Undernutrition in Crohn's disease: preliminary results from a prospective study

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Crohn's disease (CD) is a major cause of undernutrition. The evaluation of the nutritional state as well as its improvement is one of the major objectives of the care.

**The aim** of our work is to evaluate the clinical and biological characteristics of undernutrition in patients with CD and to highlight its predictive factors.

**Methods:** This is a prospective descriptive and analytical study, from September 2019 to August 2021, including 138 patients hospitalized and followed for CD and having a undernutrition (BMI <18.5). We collected the epidemiological, socio-economic and clinical characteristics as well as those related to the disease and its management.

**Results:** The mean age of our patients was 36.4 years [17-72], the sex ratio F / M = 1.6.

The disease was active (CDAI> 150) with a predominantly ileocolic topography (35%). Only 14.9% of patients had had surgical resection. Undernutrition (BMI <18.5) was: moderate 61.5%, severe: 14.95% and profound: 4.3%. We reported in our patients anemia (49.5%), lipid disorders (42%), phosphocalcic disorder (16.81%), hypoalbuminemia (56.6%) and a decrease in Vitamin B12 (26%). We initiated parenteral nutrition in 36.12% of patients associated with vitamin supplementation. The outcome was favorable in 88.23% of patients with an average weight gain of 4.3 ± 1.3 at 2 weeks

Active disease was more frequent in undernourished subjects compared to non-undernourished subjects (56% Vs 18% p = 0.002). In multivariate analysis, disease activity (p = 0.005; OR = 2.19; CI[1.15-10.16]), surgical resection (p <0.001; OR = 1.003; CI [1.01- 2.05]) and ileocolic localization p = 0.003; OR = 1.07; CI[1.03-9.07])are associated with undernutrition. In addition, a positive correlation was found between disease activity (CDAI score) and nutritional status (r = 0.209, p = 0.005).

**Conclusion:** The predictive factors in our series are disease activity, surgical resection and ileocolic localization. Nutritional support associated with disease treatment allow best outcomes

## Magnetic resonance enterography (MRE) in penetrating Crohn's disease

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**Aims:** Crohn's disease (CD) is a chronic inflammatory disease of the gastrointestinal tract. It usually affects younger people, with the peak of illness between the age of 15 and 25. Assessment of the disease activity and location along the gastrointestinal tract are of crucial importance for diagnosis and implementation of the proper treatment. Patients with established inflammatory bowel disease typically undergo repeated follow-up investigations over a lifetime.

The aim of the study was to assess the value of Magnetic Resonance Enterography (MRE) in the assessment of possible intestinal complications in patients with Crohn's disease.

**Methods:** The study included 137 patients (75 female and 62 male) diagnosed with CD, who undergone MRE with intravenous administration of a contrast agent at the Department of Interventional Radiology and Neuroradiology, Medical University of Lublin. All the studies were performed using Siemens Aera 1.5T scanner according to a local study protocol.

**Results:** In the study, 28 fistulas were identified: 4 complex perianal, 16 simple intestinal (7 blind and 9 ileo-colonic) and 8 complex intestinal (3 ileo-cecal and 5 ileo-colonic). Peri-intestinal abscess formation was observed in 9 patients. All MRE findings were further confirmed by colonoscopy, or intraoperatively if applicable.

**Conclusion:** MRE is a non-invasive, well-tolerated modality for the evaluation of CD activity and its possible complications, in particular fistulas and abscesses. Due to lack of ionizing radiation, the imaging technique is especially useful in patients that require repeated follow-up investigations. It's a basic element in diagnostics of Crohn's disease.

**Keywords:** Crohn's disease, Magnetic Resonance Enterography, Small Bowel Inflammation

## Comparison of surgical resection and biologics in ileal Crohn's Disease – a real world observational study

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**Aims:** Despite major developments in the therapy of Crohn's disease (CD), responses are still unpredictable. Indications to surgery and to biological therapy (BT) are controverse and the choice between the two treatments is often complex. We aim at comparing response rates to BT and surgery in the treatment of ileocecal Crohn's Disease.

**Methods:** Retrospective, single centre, cohort study of patients with ileocecal CD in two groups: one of 52 patients submitted to BT and the second of 36 patients submitted to ileocecal resection. Groups were comparable in the most important prognostic factors to response: age at diagnosis, smoking history, behaviour of the disease, presence of perianal disease. Patients included were the ones that had undergone a colonoscopy before and after the initiation of the treatment with a follow-up of at least six months. Mucosal healing (MH) was defined as absence of ulcers in the previously inflamed segment. Absence of postoperative recurrence (POR) was defined as Rutgeerts score i2.

**Results:** 52.8% of patients were men in both groups. Characteristics of BT and surgery groups respectively: mean age at diagnosis 30.1±12.7 and 30.7±15.1 years; smoking history positive in 56.7% and 51.4% of patients; stricturing disease in 50% and 51.1% and penetrating in 36.1% and 35.6%; perianal disease in 8.3% and 11.32%. In the BT group MH occurred in 45.3% of patients and the surgery group absence of POR was obtained in 57.1%. Mean follow-up of 1±0.9 and 1.4±1.7 years. In the surgery group 34.1% of patients maintained the BT. No statistically significant difference between responses to the two treatments (p=0.82).

**Conclusion:** Surgery is a reasonable option in the treatment of ileocecal CD. Response to this therapy is not only not different from the one to BT, but it also allows a similar percentage of patients without signs of active disease (without recurrence).

**Keywords:** Crohn's Disease, Observational study, Biological therapy, Surgery, Therapy response

## Prediction of postoperative recurrence of Crohn's Disease

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**Aims:** More than 50% of patients with Crohn's Disease (CD) may need a surgical treatment. Postoperative recurrence (POR) is common. The prognostic factors responsible for this phenomenon are controverse. Knowing the patients with the lowest risk of POR is imperious as this will enable the prevention of use of biological therapy (BT). We aim at assessing clinical and histopathological prognostic factors of POR.

**Methods:** Single center retrospective observational study. Review of clinical, endoscopic and pathological factors of 69 patients that underwent ileocecal resection for CD between 2015 and 2020. Sustained use of BT was defined as the introduction of these therapies within 6 months after surgery. Presence of recurrence defined as Rutgeerts score >= i2. A p-value of $p<0.05$ was considered statistically significant.

**Results:** Mean age at diagnosis was 29.7±14.2 years. Smoking history in 58.6% patients. 17.3% of patients had family history of IBD. 12.3% of patients had been submitted appendectomy. Stricturing disease in 32 (46.4%) patients and penetrating in 30 (43.5%). 13 patients had perianal disease. Continued BT was the therapeutic option in 21 (42%) patients. Postoperative recurrence occurred in 33 (49.3%) patients. Univariate analysis identified as predictor of POR behaviour of the disease, absence of previous appendectomy and absence of granulomas. On multivariate analysis, the absence of granulomas and lower values of postoperative C-reactive protein (CRP) were independent predictive factors of POR.

**Conclusion:** Granulomas and postoperative CRP are good predictors of POR. These factors may help in a better selection of patients not only for surgery, but also to the introduction of BT after surgery.

**Keywords:** Postoperative recurrence, ileocecal resection, Crohn's Disease, Surgery

## LIVER

### Cystatin C for Predicting Mortality in Liver Cirrhosis Patients: A Systematic Review and Meta-Analysis

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**Aim:** We aim to investigate the role of cystatin C level in predicting higher risk of mortality amongst patients with liver cirrhosis.

**Methods:** This systematic review was based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. We searched Pubmed, EBSCOhost, and ProQuest for articles published in English from inception to 2020. Titles and abstracts extracted were reviewed for relevance. Quality of study was evaluated using Newcastle-Ottawa Scale (NOS) determining quality of selection, comparability and outcome. Between-study heterogeneity was evaluated using Cochran Q test (v2).

**Results:** Search strategy identified 337 studies. Nine relevant full-text articles met our inclusion criteria with adequate reporting qualities and NOS scale of 8–9. Of them, 7 articles included for meta-analyses. Our meta-analysis using fixed-effect found that higher cystatin C level was associated with increased risk of mortality in liver cirrhosis patients (HR, 2.71; 95% CI, 2.21–3.33; $p<0.00001$; $I^2=66\%$, $p=0.007$). Using random effect, higher cystatin C level was also associated with increased risk of mortality (HR, 3.07; 95% CI, 2.09–4.50; $p<0.00001$; $I^2=66\%$, $p=0.007$).

**Conclusion:** Cystatin C level significantly predict higher risk of mortality for liver cirrhosis patients. Further studies with larger sample size need to be conducted in order to draw better conclusions.

**Keywords:** cystatin c, liver cirrhosis, mortality

## Celiac disease and the liver – long-term complications

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**Aims:** Celiac disease has been associated with abnormal liver tests at diagnosis, in particular elevated transaminases, that usually resolves after gluten-free diet. The aim of this study was to assess the evolution of liver disease and possible long-term complications in patients on a gluten-free diet.

**Methods:** Retrospective and single-center study, which included all individuals with celiac disease followed in specialized consultation in a tertiary referral hospital. Patients with liver disease due to another etiology were excluded.

**Results**: A total of 162 patients were included, most of them female (77.8%) with a median age of 24 years old (IQR 7-39). Forty (24.7%) patients with elevated transaminases (aspartate aminotransferase and/or alanine aminotransferase >31U/L) were identified. These individuals were older (32 vs. 22 years old, p=0.01) and with anti-tissue transglutaminase IgA antibody significantly higher at diagnosis (1287 vs. 153 IU/L, p <0.001) compared to patients with a normal liver profile. There were no statistically significant differences in the Marsh classification (p=0.599). After 1 and 2 years on a gluten-free diet, 72.5% and 90.0% of patients showed normal liver tests, respectively. Liver elastography, performed on average 7 years after diagnosis, showed values <6.4Kpa in all cases. It was found that 23.8% of the individuals had a CAP >250db/m. Due to persistently elevated transaminases, 3 patients underwent liver biopsy, on average 18 months after diagnosis, and the anatomopathological examination revealed mild periportal inflammatory infiltrate, without significant fibrosis (METAVIR classification 0-1).

**Conclusion:** Changes in liver tests normalized in the vast majority of individuals on a gluten-free diet, with no progression to chronic liver disease. It should be noted, however, the high number of patients with evidence of significant steatosis in hepatic elastography, which may be related to a diet which tends to be hyperlipidic and hypercaloric.

**Keywords:** Celiac disease, Liver tests, Chronic liver disease, Steatosis

## Liver tests abnormalities and chronic liver disease impact on COVID-19 inpatients' outcomes

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**Aims:** The impact of SARS-CoV-2 infection on the liver and the possibility of chronic liver disease (CLD) as a risk factor for COVID-19 severity is not fully understood. Our goal was to describe outcomes of COVID-19 inpatients regarding the presence of abnormal liver tests (LTs) and CLD.

**Methods:** Retrospective analysis of patients with SARS-CoV-2 infection, hospitalized in a Portuguese tertiary center was performed. Studied outcomes were disease and hospitalization length, COVID-19 severity, admission to intensive care unit (ICU) and mortality, analyzed by the presence of abnormal LTs and CLD.

**Results:** We included 317 inpatients with a mean age of 70.4 years, 50.5 % males. COVID-19 severity was moderate to severe in 57.4% and critical in 12.9%. Mean disease length was 37.8 days, median hospitalization duration 10.0 days and overall mortality 28.6%. At admission, 50.3% showed abnormal LTs and 41.5% showed elevated aminotransferases levels, from which 75.4% were mild. Elevated aminotransferases levels at admission were associated with COVID-19 severity (34.4% vs 18.38%, p=.001), ICU admission (13.1% vs 5.92%, p=.034) and increased mortality (25.8% vs 13.3%, p=.007). However, in subgroup analysis, only AST was associated with these worse outcomes. Alkaline phosphatase (ALP) was elevated in 11.4% of the patients and associated with critical COVID-19(21.1% vs 9.92%, p=.044) and mortality (20.4% vs 9.52%, p=.025). 24.6% of the patients showed elevated Gamma-glutamyl-transferase (GGT), which was associated with ICU admission (42.3% vs 22.8%, p=.028). Fourteen patients had baseline CLD (4.42%), 3 with liver cirrhosis. Alcohol (n=6) and non-alcoholic fatty liver disease(n=6) were the most frequent etiologies. Although without statistical significance, CLD and cirrhotic patients showed a trend towards critical COVID-19, hospitalization length and increased mortality.

**Conclusions:** LTs abnormalities in COVID-19 patients were frequent but most commonly mild. They were associated with worse clinical outcomes, such as COVID-19 severity, ICU admission and mortality. A low prevalence of CLD was seen, with a trend towards worse clinical outcomes in this group.

**Keywords:** COVID-19, SARS-CoV-2, Chronic liver disease, Cirrhosis, Liver

## The role of insulin resistance and NAFLD in the cardiometabolic risk profile of type 1 diabetes

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**Aims:** To determine the prevalence of NAFLD in T1D, to estimate insulin resistance (IR) using estimated glucose disposal rate (eGDR) and elucidate associations between NAFLD, IR and cardiovascular disease (CVD).

**Methods:** 296 T1D subjects were ultrasonographically screened for NAFLD. The eGDR was calculated as follows: eGDR (mg/kg/min) = 21,158 + (-0,09*waist circumference) + (-3,407*hypertension) + (-0,551*HbA1c). Prevalent CVD was assessed by file search. The eGDR was divided into 3 categories, with the lowest eGDR representing the highest degree of IR.

**Results:** Mean HbA1c was 7.6 ± 1.0%, mean BMI: 26.2 ± 4.5 kg/m$^2$. 36.1% was overweight, 19.6% was obese. NAFLD prevalence was 20.6%. Subjects with vs. without NAFLD were older (51 ± 16 vs. 46 ± 16 y, p=0.013), had higher BMI (29.8 ± 5.0 vs. 25.2 ± 3.9 kg/m$^2$, p<0.001); ALT (32 ± 21 vs. 24 ± 11 U/L, p<0.001); γ-GT (38 ± 33 vs. 28 ± 27 U/L, p=0.039); triglycerides (111 ± 86 vs. 79 ± 39 mg/dL, p<0.001) and lower HDL-c levels (57 ± 15 vs. 64 ± 17 mg/dL, p=0.001). 5.7% had high IR, but 26.4% expressed mild IR. NAFLD prevalence was 41%/40%/12% in the high/medium/low IR groups respectively (p<0.001). eGDR was lower in NAFLD (7.1 ± 2.0 vs. 8.8 ± 1.6 mg/kg/min, p<0.001). The prevalence of composite CVD (21.3 vs. 5.5%, p<0.001), coronary disease (CAD) (13.1 vs. 3.9%, p=0.011), peripheral artery disease (PAD) (11.7 vs. 2.7%, p=0.009) and cerebrovascular accident (CVA) (4.9 vs. 0.4%, p=0.029) were higher in NAFLD. The prevalence of CVD was 23.5%/16.0%/4.9% in the high/medium/low IR groups respectively (p=0.001). Independent risk factors for CVD were NAFLD (OR:4.0, p=0.010), eGDR (OR:1.3, p=0.047) and age (OR:1.1, p=0.005).

**Conclusion:** NAFLD and IR are independently correlated with prevalent CVD in T1D. These results suggest a pivotal role of NAFLD and IR in the cardiometabolic profile of T1D.

**Keywords:** NAFLD, Insulin resistance, Cardiovascular disease, Type 1 diabetes

## Assessment of hepatic fibrosis using transient elastography in patients with obstructive sleep apnea: an observational study

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**Aims:** Recent clinical data have shown that obstructive sleep apnea (OSA), through its hypoxia related consequences leads to tissue hypoxia, thereby resulting in oxidative stress, inflammation, and sympathetic system activation, and could therefore be an independent risk factor for non-alcoholic fatty liver disease and steatohepatitis. The primary aim of this observational study is to study the effect of OSA on the degree of liver stiffness, estimated using transient elastography, a novel technique to assess liver fibrosis.

**Methods:** The study was conducted on outpatients and inpatients of a tertiary care center who are polysomnography (PSG) proven OSA patients and meet the eligibility criteria. Patients were enrolled to undergo transient elastography (fibroscan) and the following investigations – complete hemogram, liver function tests, serum lipid profile, serum fasting insulin and fasting blood sugar levels. The polysomnography, fibroscan and laboratory data was tabulated and analysed.

**Results:** A total of 36 participants were enrolled. 4 (11.1%) participants had mild OSA, 11 (30.6%) moderate OSA and 21 (58.3%) of the participants had severe OSA. The prevalence of liver steatosis was assessed to be 83.3% (30 patients) while hepatic fibrosis was noted in 11.2% (4 patients). Oxygen desaturation events, oxygen desaturation index, apnea-hypopnea index and percentage of sleep spent below 90% oxygen saturation (T90) were significant predictors of hepatic fibrosis.

**Conclusion:** Patients with OSA have an increased risk for development of hepatic steatosis and fibrosis. The various PSG parameters can be helpful in predicting the presence of underlying liver disease and aid in screening of at-risk OSA patients.

**Keywords:** Hepatic fibrosis, Obstructive sleep apnea, Non-alcoholic fatty liver disease

## Malnutrition in cirrhotic patients with refractory ascites treated with large volume paracentesis

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**Background/Aims:** Malnutrition is a common issue in patients with decompensated cirrhosis with refractory ascites. The first-line treatment is large volume paracentesis (LVP) associated with administration of intravenous albumin. Nutritional evaluation with measurement of anthropometric parameters at baseline has been considered to be a reliable safe method to assess nutritional status. Repeated paracentesis, early satiety and anorexia exacerbatemalnutrition. The aim of our study was to correlate the severity of liver disease using Child-Pugh (CP) and MELD-Na scores with clinical deterioration evaluated by ECOG Performance Status, Subjective Global Assessment (SGA), nutritional and laboratory evaluation.

**Materials and Methods:** We selected a group of 15 decompensated cirrhotic patients with refractory ascites that underwent large volume paracentesis. A baseline assessment by gastroenterologist doctor and nutritionist was performed. We used SGA to determinate nutrition status. Anthropometric data was collected including triceps skinfold mid upper arm circumference and mid arm muscle circumference. Handgrip strength was also assessed through dynamometry. The Harris–Benedict equation was applied to estimate the individuals basal metabolic rate. The Child Pugh Score, Meld-Na and ECOG PS were calculated at baseline.

**Results:** From our group study we observe that 11 of the patients (73%), were Child Pugh B score (8 points), 13 patients (87%) had a Meld Na >15 points and 9 patients (60%) had ECOG PS 1. Patients present SGA score 2 and 3. All the patients had handgrip strength under $P_{10}$ and the measures of triceps skinfold and mid upper arm circumference below $P_{15}$. These results indicate low fat and proteins reserves highly suggestive of malnutrition.

**Conclusion:** Patients with decompensated cirrhosis with refractory ascites undergoing LVP have frequently malnutrition. These patients present a higher CP Score and Meld-Na, showing muscle wasting and low-fat reserves. Baseline nutritional status and counselling is significantly important.

**Keywords:** malnutrition, chronic liver disease, cirrhosis, refractory ascites

## PANCREAS

### Comparison of severity of pancreatitis with and without diclofenac sodium in post ERCP patients

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**Objective:** To compare the severity of pancreatitis after ERCP in patients receiving prophylactic intramuscular diclofenac sodium combined with standard treatment in comparison with standard treatment alone within 48 hours after the procedure

**Subjects and methods:** Present study was a randomized controlled trial in which we enrolled a total of one hundred and sixty (n=160) patients of either gender between age 20-70 years who presented with obstructive jaundice. Patients were randomly divided into 2 groups. Group A was administered 75 mg of diclofenac sodium intramuscularly as an add on prophylactic therapy along with the standard treatment and Group B was administered with standard treatment alone. All the patients were monitored for 48 hours for any complaint of abdominal pain and measurements of serum lipase and amylase at 4 and 24 hours after the procedure.

**Results:** Our study results showed that 4 hours after the procedure: in group A patients mean serum amylase was 266.8 U/L ± 57.9 SD and it was 261.6 U/L ± 57.6 SD in group B patients (p=0.566). Mean serum lipase was 1061.1 U/L ± 279.3 SD in group A and it was 1018.6 U/L ± 281.5 SD in group B patients (p=0.345). At 24 hours after the procedure: in group A patients mean serum amylase was 137.7 U/L ± 84.6 SD and it was 170.3 U/L ± 132.1 SD in group B patients (p=0.065). Mean serum lipase was 326.1 U/L ± 116.4 SD in group A and it was 362.1 U/L ± 137.2 SD in group B patients (p=0.071). PEP was diagnosed in 3.8% (n=3/80) in group A patients while it was diagnosed in 13.8% (n=11/80) patients in group B (p=0.025).

**Conclusions:** Efficacy of intramuscular diclofenac sodium for prophylaxis of post-ERCP pancreatitis was significantly better when compared with control group

**Keywords:** Diclofenac sodium, ERCP, post ERCP pancreatitis

## A Rare Case of Acute Pancreatitis Associated with Energy Drink Consumption

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**Aim:** Daily consumption of energy drinks has been increasing over the past several years. Common side effects of these drinks have included diarrhea, heartburn and dyspepsia. We present a case of acute pancreatitis likely secondary to excess consumption of energy drinks.

**Case:** A 29-year-old male without a significant past medical history presented to the hospital with 10/10 epigastric abdominal pain with associated nausea and vomiting since the morning of admission. The patient denied any history of alcohol use, recreational drug use, trauma or family history of pancreatitis or cancer. The patient did endorse drinking an upwards of 5-6 energy drinks on weekdays.

**Result:** His labs were significant for lipase 3122 U/L, AST 115, ALT 110 and normal alkaline phosphatase. The patient's lipid panel, immunoglobulin G4 and urine toxicology were all unremarkable. An abdominal US revealed pancreatitis without cholelithiasis or choledocolithiasis. A CT abdomen confirmed the US findings. Further genetic workup for mutations were negative. Thus, the etiology of the pancreatitis was determined to be due to his excessive consumption of energy drinks. The patient was instructed to stop drinking energy drinks on discharge.

**Conclusion:** Acute pancreatitis is commonly caused by gallstones and alcohol use. Energy drinks as a potential cause of acute pancreatitis is a rare but important etiology to be aware of. All acute pancreatitis patient's should be asked about their daily consumption of energy drinks if the etiology is unknown.

**Keywords:** Acute pancreatitis, Pancreas, Energy Drinks

## Regional intra-arterial infusion in the treatment of severe acute pancreatitis

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**Materials and methods:** A randomized controlled trial was conducted in 23 patients with severe acute pancreatitis (TOP) (n=23), who received intra-arterial infusion (AI) of protease inhibitors and antibiotics, and 23 received intravenous drugs. The average duration of intra-arterial infusion was 4.6 days.

**Results:** After PRAI reduced mortality (from 17.39% to 4.34%, p<0.001), terms of stay in the ICU and hospital (from 11.8 to 4.6 and from 24.6 to 13.3 days).

**Conclusion:** Application PRAI in the complex of intensive conservative therapy can reduce mortality, the number of complications and surgical interventions, and reduce the duration of treatment.

AP is accompanied by autolysis of pancreatic tissues, so an important role of proteolytic enzyme inhibitors in treatment is assumed.

According to the results of a CT study according to the E. J. Balthazar classification, 6 patients were found to have Class E (26.08%), class D – in 12 (52.17%), class C – in 5 patients (21.73%), and these indicators were comparable in the control group.

The average time spent in ICU in the main group was 4.6 days, in the control group 11.8; the total time of hospitalization in the main group was 13.3 days, in the control group-24.6 days (interval from 15 to 53 days).

Mortality in the main group was 4.34 % (1 out of 23 patients), in the control group-17.39% (4 out of 23 patients).

The incidence of purulent-septic complications was significantly higher in the control group (34.78% vs. 4.34% in the main group). The need for surgical interventions in the control group occurred in 8 patients (34.78%), in the main group – in 1 patient (4.34%).

Regional arterial infusion of protease inhibitors and antibiotics can significantly reduce mortality, the frequency of infectious complications, and the need for surgical interventions. This method also allows you to reduce the duration of treatment in the hospital and the cost of treatment.

## OTHERS

### Acute Complicated Colonic Diverticulitis in Patients with COVID-19: A Single-center Case Series

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**Aims:** The management of acute diverticulitis has evolved, adapting a more individualized approach. With a high postoperative mortality rate in patients with COVID-19, adapting a more conservative management could be beneficial for the management of acute complicated diverticulitis. This study aims to present the clinical profile, treatment strategies and outcomes of COVID-19 patients diagnosed with acute complicated colonic diverticulitis at a single tertiary hospital in the Philippines.

**Methods:** The study is a descriptive case series on COVID-19 patients who were also diagnosed with acute colonic diverticulitis between May 2020 to August 2021 at a single tertiary institution in the Philippines. The demographics, clinical history, severity of COVID-19, type of intervention, and post-procedural outcomes of the five patients are reported. Whole abdomen CT scan was performed in confirming the presence of colonic diverticulitis.

**Results:** Five cases of COVID-19 diagnosed concomitantly with acute colonic diverticulitis were included in the study. All five cases underwent an intervention for their diverticular disease. One patient underwent surgical intervention after failure of conservative management. Four patients underwent percutaneous drainage. Two of them were successfully treated with percutaneous drainage while the other two had treatment failure. The first case of treatment failure subsequently underwent surgery with a good postoperative outcome. The second case, however, succumbed to COVID-19 complications.

**Conclusion:** This case series was able to show that a nonoperative approach can be employed in managing acute complicated diverticulitis without jeopardizing the treatment of COVID-19. In the same way, utilizing this conservative method provides an opportunity to optimize the patient if surgery is eventually needed.

**Keywords:** COVID-19, Diverticulitis

## Quadruple hybrid therapy as first-line regimen for *Helicobacter pylori* eradication in a high clarithromycin resistance country: can a close medical-patient relationship influence it?

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**Background:** Standard triple therapy is no longer acceptable in patients with high *Helicobacter pylori* (*H. pylori*) resistance to clarithromycin. Quadruple therapies must be the first choice, but there are few data available about quadruple hybrid therapy. We evaluated the success of such treatment in a cohort of patients followed by a single Gastroenterologist largely dedicated to this pathology.

**Methods:** This was a retrospective study that included 91 treatment-naïve patients (male-53.8%; mean age-53.2±16.2 years) diagnosed with *H. pylori* infection by positive histology and/or urea breath test (UBT). Dyspepsia was the main indication for treatment-66.3%. The hybrid therapy consisted of 40 mg esomeprazole (b.i.d.) and 1 g amoxicillin (12/12h) for 14 days, with the addition of 500 mg clarithromycin (12/12h) and 500 mg metronidazole (8/8h) for the final 7 days. All patients received detailed oral and written information about the treatment, potential side effects and interactions. Eradication was defined by negative UBT or histology.

**Results:** The eradication rates were 92.3% (84/91; 95%CI 84.9-96.2%) by intention-to-treat and 95.3% (82/86; 95%CI 88.6-98.1%) by per-protocol analysis. Compliance rate was 94.5% and adverse events occurred in 27.5%, mainly mild (14/25), being dysgeusia the most frequent (19/25). Only 3.3% of patients presented severe adverse events. No compliance (40% vs 5.8%; p=0.046) and diarrhea (as secondary effect (44% vs 0%; p=0.01) were associated with unsuccessful treatment.

**Conclusions:** Quadruple hybrid therapy is an effective and safe first-line regimen in countries with high *H. pylori* resistance to macrolides. A close relationship between the doctor and his patients could increase compliance and consequently the eradication efficacy.

## Dupilumab Efficacy and Safety in Adolescent and Adult Patients With Eosinophilic Esophagitis: Results From Part A of a Randomized, Placebo-Controlled, Three-Part, Phase 3 Study

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**Aims:** Eosinophilic esophagitis (EoE) is a chronic type 2 inflammatory disease of the esophagus. Dupilumab, a fully human mAb, blocks the shared receptor component for IL-4/IL-13, key and central drivers of type 2 inflammation. In a phase 2 proof-of-concept study, dupilumab improved EoE outcomes with an acceptable safety profile. Part A of the 3-part, phase 3 TREET study (NCT03633617) evaluated efficacy/safety of weekly dupilumab 300mg vs placebo in adolescent/adult patients with EoE for 24 weeks.

**Methods**: 81 patients were randomized 1:1 to dupilumab (n=42) or placebo (n=39). Co-primary endpoints were proportion of patients achieving peak esophageal intraepithelial eosinophil (eos) count ≤6eos/high-power field (hpf) and absolute change in Dysphagia Symptom Questionnaire (DSQ) score from baseline. Secondary endpoints included proportion of patients achieving peak eos count <15eos/hpf; percent change from baseline in peak eos count; and change from baseline in total EoE Endoscopic Reference Score (EREFS), and EoE diagnostic panel (EDP) or type 2 inflammatory gene expression, as measured by normalized enrichment score (NES).

**Results:** Baseline characteristics were comparable across treatment groups. At Week 24, dupilumab-/placebo-treated patients had: higher proportions of patients with peak eos count ≤6eos/hpf (59.5%/5.1%) and <15eos/hpf (64.3%/7.7%); greater percent change in peak eos count (least squares [LS] mean difference −68.26% [95% CI −86.90, −49.62]); greater change in DSQ score (LS mean difference −12.32 [95% CI −19.11, −5.54]); greater change in total EREFS (LS mean difference −2.9 [95% CI −3.91, −1.84]); and suppressed EDP NES (median difference −2.25 [95% CI −2.72, −1.73]) and type 2 inflammation NES (median difference −1.59 [95% CI −1.74, −1.27]) (all $P$<0.001). Dupilumab was generally well tolerated; the most common treatment-emergent adverse events for dupilumab/placebo were injection-site reactions (16.7%/10.3%) and nasopharyngitis (11.9%/10.3%).

**Conclusion:** Dupilumab demonstrated significant clinically meaningful improvements in histologic, symptomatic, endoscopic, and molecular outcome measures of EoE, and was well tolerated.

**Keywords:** Dysphagia, Therapeutics, Randomized controlled trial

## Dupilumab Improves Health-Related Quality of Life and Reduces Symptom Burden in Patients with Eosinophilic Esophagitis: Results from Part A of the Three-Part Phase 3 LIBERTY EoE TREET Study

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**Aims:** Dupilumab, a fully human monoclonal antibody, blocks the shared receptor component for interleukin (IL)-4 and IL-13. Part A of a randomized, placebo-controlled three-part, phase 3 study (NCT03633617) evaluated the efficacy and safety of weekly doses of 300mg dupilumab versus placebo in adolescent and adult patients with EoE. Co-primary endpoints, proportion of patients achieving peak esophageal intraepithelial eosinophil count ≤6 eos/hpf and change from baseline in Dysphagia Symptom Questionnaire (DSQ) score at Week 24, were achieved and dupilumab was well tolerated. This analysis assesses the effect of dupilumab versus placebo on health-related quality of life (HRQoL) and symptom burden at Week 24 (secondary/exploratory endpoints).

**Methods**: 81 patients (dupilumab=42; placebo=39) were enrolled. HRQoL was assessed by 11-item EoE Impact Questionnaire (EoE-IQ), measuring emotional, social, productivity, and sleep-related impacts of EoE (score range: 1–5). Symptom burden was assessed by 5-item EoE Symptom Questionnaire (EoE-SQ-Frequency), measuring frequency of EoE symptoms other than dysphagia/swallowing pain, including chest pain, stomach pain, heartburn, regurgitation, and vomiting (score range: 5–25). Higher EoE-IQ/EoE-SQ-Frequency scores indicate greater impact on HRQoL/symptom burden. Proportion of patients reporting dysphagia improvement on the Patient Global Impression of Change (PGIC) was evaluated.

**Results:** At baseline, mean EoE-IQ was 2.0/2.4 and mean EoE-SQ-Frequency 10.1/11.5 in dupilumab/placebo groups, respectively. At Week 24, LS mean change from baseline difference for dupilumab versus placebo was −0.4 (95% CI: −0.6, −0.1; nominal $P$=0.008) for EoE-IQ and −1.7 (−2.9, −0.5; nominal $P$=0.005) for EoE-SQ-Frequency. At Week 24, 40.5% versus 7.7% (nominal $P$<0.001) of dupilumab versus placebo patients reported dysphagia as "very much better" compared with baseline on the PGIC; 26.2% versus 10.3% (nominal $P$=0.074) reported "moderately better".

**Conclusion:** Weekly dupilumab improved disease-specific health-related quality of life and reduced symptom burden in adolescent and adult patients with eosinophilic esophagitis.

**Keywords:** Eosinophilic Gastritis Diagnosis, Treatment, Eosinophilic Esophagitis Diagnosis, Treatment, Eosinophilic Enteritis Diagnosis, Treatment, Eosinophilic colitis Diagnosis, Treatment, Eosinophilic Gastrointestinal Disease

## Dupilumab Reduces Type 2 Inflammation Biomarkers in Adolescent and Adult Patients with Eosinophilic Esophagitis: Results from Part A of the 3-part Phase 3 LIBERTY EoE TREET Study

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**Aims:** Treatments for eosinophilic esophagitis (EoE), a chronic type 2 inflammatory disease, are limited. Dupilumab, a fully human monoclonal antibody, blocks the shared receptor component of IL-4/IL-13, key and central drivers of type 2 inflammation in multiple diseases. This prespecified analysis of part A of the 3-part, double-blind, placebo-controlled, phase 3 LIBERTY EoE TREET study (NCT03633617) assessed the effect of dupilumab on circulating biomarkers of type 2 inflammation over the 24-week treatment period.

**Methods:** 81 patients received either dupilumab (n=42) or placebo (n=39) for 24 weeks. The median levels and median change from baseline (ΔBL) in serum thymus and activation-regulated chemokine (TARC), plasma eotaxin-3, and serum total IgE were assessed at Weeks 4, 12, and 24.

**Results:** BL TARC, eotaxin-3, and total IgE were similar between treatments (median [Q1–Q3] for dupilumab vs placebo: TARC, 322.0pg/mL [232.0–430.0] vs 293.0pg/mL [226.0–418.0]; eotaxin-3, 217.5pg/mL [139.0–330.0] vs 217.0pg/mL [163.0–448.0]; total IgE, 110.0kU/L [51.1–463.0] vs 100.0kU/L [46.7–294.0]). At Weeks 4, 12 and 24, respectively for dupilumab vs placebo, median [ΔBL] TARC was 174.5pg/mL [-109.0pg/mL] vs 287.5pg/mL [-1.5pg/mL], 188.5pg/mL [-109.0pg/mL] vs 286.5pg/mL [-9.0pg/mL], 196.5pg/mL [-115.5pg/mL] vs 319.0pg/mL [-35.0pg/mL]; eotaxin-3 was 114.5pg/mL [-109.1pg/mL] vs 229.0pg/mL [-4.0pg/mL], 115.0pg/mL [-118.4pg/mL] vs 213.5pg/mL [-14.5pg/mL], 110.0pg/mL [-88.6pg/mL] vs 203.0pg/mL [-9.0pg/mL]; and total IgE was 97.9kU/L [-13.6kU/L] vs 87.9kU/L [-0.7kU/L], 80.6kU/L [-32.1kU/L] vs 105.0kU/L [-1.8kU/L], 59.8kU/L [-45.7kU/L] vs 106.0kU/L [-8.6kU/L] (all $P$<0.0001 for dupilumab vs placebo in median ΔBL). Dupilumab was well tolerated; the most common treatment-emergent adverse event was injection-site reaction (16.7% dupilumab vs 10.3% placebo).

**Conclusion:** Over the 24-week treatment period, dupilumab treatment led to rapid and sustained suppression of serum TARC and plasma eotaxin-3 levels, and gradual suppression of serum total IgE level in adolescents and adults with EoE. These results demonstrate IL-4/IL-13-dependent regulation of type 2 inflammation in EoE. The relationship between biomarker changes and clinical outcomes in patients with EoE needs further study.

**Keywords:** Eosinophilic Gastrointestinal Disease, Eosinophilic colitis Diagnosis, Treatment, Eosinophilic Enteritis Diagnosis, Treatment, Eosinophilic Esophagitis Diagnosis, Treatment, Eosinophilic Gastritis Diagnosis, Treatment

## Efficacy and safety of specialized food product SPP2 in treatment of patients with non-alcoholic steatohepatitis

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**Aim**: to assess safety and efficacy of developed specialized food product SPP2 in patients with non-alcoholic steatohepatitis.

**Methods**: New specialized food product (SPP2) consisted of (% of the RDAs): protein 11%; fat 2% (including ω-3 PUFA 17%); soluble dietary fiber 100%; phospholipids 25%; alphalipoic acid 33%; taurine 30%; L-carnitine 33%; vitamins (A, E, D3, K1, C, B1, B2, B6, B12, PP, Folic acid, Pantothenic acid, Biotin) 35%–130%. The study (NCT04308980) was approved by LEC and enrolled patients with diagnosis of NASH. Subjects were randomized to the following groups: those received iso-calorie diet (according to REE, by indirect calorimetry) alone (ICD) and iso-calorie diet+SPP2 (2 portions of SPP2 a day, 14 days, ICD+SPP2 group). Safety was assessed based on clinical and laboratory data. Repeated measurements (baseline vs those on the 15th day of the study) of body composition, and blood chemistry were compared with non-parametric statistics.

**Results**: The results of complex examination of 20 subjects (12 in ICD + SPP1 and 8 in ICD group) served as a source for the study. Initially, groups did not differ by age, sex, and BMI. The product was well tolerated. In contrast to ICD group, those in ICD+SPP2 group demonstrated greater decrease of weight: BMI initially ($BMI_0$), Mean±SD: 39.8±12.3 kg/m$^2$ vs BMI at the end-point ($BMI_{EOT}$) 38.9±11.8 kg/m$^2$, P=0.02 in ICD+SPP2 group, whereas in the ICD group $BMI_0$ 38.9 ± 7.2 kg/m$^2$ vs $BMI_{EOT}$ 38.9 ± 7.3 kg/m$^2$, P=0.08. This was caused mainly by reduction of body fat weight $(BFW)_0$ 50.7±29.7 kg vs $BFW_{EOT}$ 29.5±28.8 kg, P=0.017 in ICD+SPP2 group, whereas $BFW_0$ 48.9±11.4 kg vs $BFW_{EOT}$ 47.8±11.6 kg, P=0.07 in ICD group.

**Conclusions**: The new specialized food product "SPP2" is safe, and well tolerated by patients with NASH. In combination with iso-calorie diet, it may increase efficacy of weight loss, predominantly by fat.

**Keywords:** Non-alcoholic fatty liver disease, Non-alcoholic steatohepatitis, specialized food product, SPP2

## Association between Chronic Nausea/Vomiting and Sleep-Related Leg Cramps in a Longitudinal Study of the American General Population

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**Aims:** Chronic nausea and vomiting (CNV) are common symptoms in patients with gastroparesis. CNV is associated with a higher risk of potassium deficiency. This study examines whether CNV is a predictive factor of developing Sleep-Related Leg Cramps (SLC) or Restless Legs Syndrome (RLS) over three years.

**Methods**: Prospective longitudinal study with two waves: 12,218 subjects were interviewed by phone during wave 1 (W1) and 10,931 during wave 2 (W2) three years later. Subjects were representative of the general population based on the US Census. Analyses were performed on subjects participating in both waves (N=10,931). CNV was defined as episodes of nausea and vomiting occurring at least twice a month for at least one month (outside pregnancy). SLC and RLS were defined according to the International Classification of Sleep Disorders.

**Results:** At W1, 9.8% (95%CI:9.2%-10.4%) of the sample reported nausea only, while 3% (95%CI:2.7%-3.3%) reported CNV. CNV Participants were significantly younger than those without CNV (mean age of 45.6 vs. 52.7 years; p<0.001) and had a higher body mass index (BMI, 30.2 vs. 27.8; p<0.001). At W2, 7.7% (95% CI:7.2%-8.2%) reported nausea only and 2.5% (95%CI:2.2%-2.8%) reported CNV; 25.7% of them were chronic (reported at W1 and W2). At W2, 11.5% (95% CI:10.9%-12.1%) reported SLC and another 2.5% (95%CI:2.2%-2.8%) reported RLS. After controlling for age, sex, BMI, health status and alcohol intake, individuals with CNV at W1 and W2 had a relative risk 4.6 times higher (95%CI:3.1-6.9; p<0.0001) of SLC at W2, compared to participants without CNV. Similarly, CNV at W1 and W2 carried a significantly increased risk of 7.5 (95% CI:4.5-12.6; p<0.0001) for RLS at W2.

**Conclusion:** CNV is associated with the development of nocturnal leg problems. Patients with GI disorders characterized by nausea/vomiting symptoms for years (e.g., gastroparesis) need attention to avoid the occurrence of nocturnal leg problems.

## Interactions between Chronic Nausea/Vomiting and Non-Restorative Sleep in a Longitudinal Study of the American General Population

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**Aims:** Chronic nausea and vomiting (CNV) are common symptoms in gastroparesis. This study aimed to evaluate the consequences of CNV on Non-Restorative Sleep (NRS).

**Methods**: Prospective longitudinal study with two waves: 12,218 subjects interviewed by phone during wave 1 (W1), 10,931 during wave 2 (W2) three years later. The sample was representative of general population based on the US Census. Analyses included subjects participating in both waves (N=10,931). CNV was defined as episodes of nausea and vomiting occurring at least twice/month for at least one month (outside pregnancy). NRS was defined as sleep of normal duration (≥7 hours) but unrefreshing.

**Results:** At W1, 9.8% (95%CI:9.2%-10.4%) reported nausea only and 3% (95% CI:2.7%-3.3%) reported CNV. At W2, 7.7% (95% CI:7.2%-8.2%) reported nausea only and 2.5% (95%CI:2.2%-2.8%) reported CNV; 25.7% of them had CNV at both W1 and W2.[CJ1] Participants with CNV were significantly younger than those without CNV (mean age 45.6 vs. 52.7 years; p<0.001) and had a higher body mass index (BMI, 30.2 vs. 27.8; p<.001). CNV subjects were more likely to have an Insomnia Disorder or an Obstructive Sleep Apnea (28.8% and 12.1%, respectively) than non-CNV participants (12.9% and 2.7%). A total of 1607 subjects (14.7%; 95%CI:14%-15.4%) reported NRS at W1, and 1432 subjects (13.1%; 95%CI:12.5%-13.7%) at W2. NRS was present in 32.4% of CNV subjects at W1 and in 29% at W2. After controlling for age, sex, BMI, health status, alcohol and sleep disorders, CNV subjects participating in both waves had a 1.8 relative risk (RR, 95%CI:1.2-2.8; p<0.01) of reporting NRS at W2 compared to non-CNV subjects. Similarly, CNV incidence at W2 carried an increased NRS RR of 3.0 (95%CI:1.9-4.7; p<0.0001).

**Conclusion:** Patients with CNV had two-fold higher NRS risk, indicating that sleep could be disturbed in patients with disorders characterized by chronic nausea/vomiting including gastroparesis.

**Disclosure:** This analysis study was funded by Takeda Pharmaceutical Company. YJC is currently a Takeda employee and may own stocks/stock options.

## Lack of transcriptionally active Nrf2 mitigates colon dysfunction in an age- and sex- dependent manner

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**Aims:** We aimed to verify how the lack of transcriptional activity of Nrf2 influences the development and functionality of the colon.

**Methods:** We used female and male mice (3 and 6 months), with the functional Nrf2 (WT) or with the transcriptionally inactive form of Nrf2 (tKO), as well as IL-10 lacking mice as a positive control (n=6 per group and test). Functional tests of gastrointestinal (GI) track activity were used, followed by the total macroscopic and microscopic damage score and markers of inflammation, oxidative stress, muscular cells, innervation, and deposition of ECM proteins.

**Results:** The results showed that most functional and morphological changes are observed in Nrf2-tKO females, and resemble changes in IL-10-KO mice. We found that young Nrf2-tKO females had significantly prolonged whole GI transit ($p<0.01$) and twice as fast developed diarrhea ($p<0.05$). Of note, the severity of changes diminished with age. Additionally, only young Nrf2-tKO females had significant histological alterations in proximal rather than middle and distal colon, higher number of circulating WBC ($p<0.01$) and elevated ($p<0.01$) colon MPO activity. Moreover, young Nrf2-tKO females had markedly lower level of colon reduced glutathione ($p<0.05$). We also noticed significant depletion of α-smooth muscle cell actin ($p<0.05$) in the distal colon but no meaningful alteration of ECM remodeling proteins like colon MMP-1; -3 or -12 and serum TGFβ. The abnormalities observed in young tKO females resembled changes observed in IL-10-KO mice. None of the above listed changes were observed in Nrf2-tKO males.

**Conclusions:** Transcriptional inactivation of Nrf2 may influence colon development and functionality at basal conditions in females rather than males. The changes in colon function resemble those observed during IBD development but without manifestation of disease symptoms. The observed abnormalities seem to diminish with age (Supported by the Sonata 14 program of the National Science Centre 2018/31/D/NZ4/00077 to APP).

**Keywords:** Nrf2, inflammatory bowel diseases, inflammation, Gastrointestinal transit

## Pantoprazole-induced delirium: a rare complication after endoscopic submucosal dissection

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A 72-year-old woman was admitted at our hospital for an ESD of a 30mm type 0-IIa+IIc gastric lesion with central erosion, located in the lesser curvature of the antrum. She was previously medicated with amlodipine plus telmisartan, bromazepam 1.5mg id and pantoprazole 20mg id. The procedure went without complications and the patient was admitted for surveillance, treated with pantoprazole perfusion at 8 mg/h as well as her regular medication. In the first 24 hours, she presented well, without complications. The following night, the patient presented a hyperactive acute confusional state. She adopted a defensive posture, refusing some physical examination gestures, complementary exams and medication. Her vital signs, physical exam and blood/urine tests were unremarkable. She was evaluated by a Neurologist who suspected of a pantoprazole-induced delirium, with persecutory delusions. Pantoprazole perfusion was stopped and changed to per os. The morning after, the patient presented a normal behavior, was oriented in all spheres and the delusions had stopped.

Acute confusional state or delirium is characterized by a fluctuating course of disturbance in attention and cognition. Risk factors include predisposing conditions – such as old age, multiple comorbidities and polymedication – and precipitating factors – such as severe illness, anesthesia, dehydration or new drugs. Proton-pump inhibitors are amongst the most prescribed drugs. Despite their safety, there have been reported cases of psychiatric side effects such as hallucinations, altered mental status and psychomotor agitation. In this particular case, the temporal relation with high doses of drug perfusion, the exclusion of other precipitating factors and the clinical improvement following drug withdrawal is suggestive of the diagnosis.

Physicians must keep in mind this rare but real side effect of pantoprazole and other proton-pump inhibitors.

## Association of coexisting autoimmunity to the baseline features and long-term outcomes in celiac disease

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**Aims:** Celiac disease (CD) patients have an increased risk for coexisting autoimmune diseases (AID), but the possible effects of these to the baseline features and long-term treatment success in CD remain obscure.

**Methods:** Altogether 806 CD patients on dietary treatment (median 9.7 years) underwent evaluation of the presence of coexisting AID and other medical data and blood sampling for CD serology, as well as filled validated questionnaires about the current symptoms (GSRS) and quality of life (PGWB). The results were compared between CD patients with and without coexisting AID.

**Results:** Altogether 185 (23%) patients had CD+AID and 621 CD alone. The most common AIDs were thyroidal diseases (13%), T1 diabetes (3%) and rheumatoid arthritis (3%). CD+AID group was older at CD diagnosis (median 42 vs 36 years, p=0.010) and presented more often with arthralgia (9% vs 4%, p=0.011). The groups had otherwise comparable clinical and histological presentation of CD and family history of CD. At current evaluation, there were no differences in dietary adherence or serological and histological recovery. Nevertheless, the CD+AID group perceived poorer general health (median score 12 vs 14 points, p<0.001) in PGWB and reported more overall gastrointestinal symptoms (2.1 vs 1.9, p=0.001) and constipation (2.0 vs 1.7, p<0.001) in GSRS.

**Conclusions:** Although common, co-existing AIDs have only a minor effect on the phenotype and treatment success in CD. However, the reduced self-perceived health indicates a need for special support for these patients.

**Keywords:** celiac disease, autoimmunity, adherence, quality of life

## Persistent symptoms are diverse and associate with health concerns and decreased quality of life in adult celiac disease patients diagnosed in childhood

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**Aims:** The prevalence and associated factors of persistent symptoms despite a strict gluten-free diet (GFD) in adult celiac disease patients diagnosed in childhood are unclear.

**Methods**: Altogether 239 currently adult patients with a pediatric diagnosis underwent collection of medical data from patient records and responded structured study questionnaires. All variables were compared between patients with and without persistent symptoms.

**Results:** Altogether 180 patients reported a strict GFD. Of them, 18% experienced persistent symptoms, including various gastrointestinal symptoms (73%), arthralgia (39%), fatigue (39%), skin symptoms (12%) and depression (6%). Those reporting persistent symptoms had more often gastrointestinal comorbidities (19% vs 6%, p=0.023), health concerns (30% vs 12%, p=0.006) and experiences of daily life restrictions (64% vs 43%, p=0.028) than the asymptomatic subjects. Additionally, the symptomatic patients had lower PGWB general health (median 13 vs 14, p=0.040) and vitality (15 vs 18, p=0.015) scores and more severe gastrointestinal symptoms in GSRS (total score 2.1 vs 1.7, p<0.001). Except general health, these differences remained significant after adjusting with comorbidities. The groups were comparable in current sociodemographic characteristics and health behaviour. Furthermore, none of the childhood features, including clinical, serological and histological presentation at diagnosis, and adherence and response to a GFD after 6-24 months predicted the symptom persistence in adulthood.

**Conclusion:** Almost one-fifth of adult patients diagnosed in childhood report persistent gastrointestinal and extraintestinal symptoms despite a strict GFD. The ongoing symptoms were associated with health concerns and decreased quality of life.

**Keywords:** Celiac disease, Persistent symptoms

# POSTERS

## ENDOSCOPY

### Cold forceps polypectomy compared to Cold snare polypectomy for diminutive colorectal polyps

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**Objectives:** Nowadays, there is a diversity of endoscopic techniques used for the resection of diminutive colorectal polyps (DCPs; ≤5 mm). The most used are cold snare polypectomy (CSP) and cold forceps polypectomy (CFP). We aimed to compare the histologic polyp eradication rate of CSP with that of CFP using double-biopsy technique.

**Methods:** This was a randomized controlled trial at a single endoscopic unit from January to June 2021. Fifty-four patients having 93 eligible polyps were enrolled in this study. To evaluate histologic eradication of polyps, two or more additional biopsies were taken from the base and edges of the polypectomy site.

**Results:** The mean size of polyps was 3.4 mm (±1.3). Most polyps evaluated were tubular adenomas (57%). There was no difference in the rate of histologic eradication between the CSP group and the CFP group (93.2% vs. 91%, P=0.9). The time taken for polypectomy was significantly shorter in the CSP group (14 vs. 30 s, P<0.001). 6.6% of polyps resected by cold snare were lost. While all the polyps resected by cold forceps were recovered. Polyps were more fragmented in the CFP group than the CSP group (27% versus 20%, p=0.05). We noted in the CSP group the occurrence of bleeding in 3% of patients that required the use of a clip.

**Conclusions:** CSP is not superior to CFP for the endoscopic removal of DCPs with regard to completeness of polypectomy. CFP technique should be considered the primary method for endoscopic treatment of polyps<3mm given its safety.

**Keywords:** Diminutive polyps, cold snare polypectomy, cold forceps polypectomy

## Impact of educational program on the quality of bowel preparation for colonoscopy

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**Introduction:** It is challenging to achieve high-quality bowel preparation among patients scheduled for colonoscopy. This study aims to evaluate the impact of an intensive patient educational program on the quality of bowel preparation.

**Methods:** A prospective study was carried out at the outpatient endoscopic unit of Military Hospital of Tunis. Patients were randomly assigned to the control group (received standard written and verbal instructions) or the experimental group (received an intensive and structured educational program: one phone call 5 days before the exam and a second call the day before the exam). All subjects completed a questionnaire before colonoscopy to assess their compliance, acceptability, and tolerability towards bowel preparation regime. Quality of bowel preparation was determined using the Boston Bowel Preparation Scale (BBPS).

**Results:** We included 70 patients in our study. The mean age was 54 years old [18-72]. All participants received 4 L of polyethylene glycol or sodium Picosulphate in a split-dose regimen. The average delay between last dose preparation and colonoscopy was 8 hours [2-17]. The mean Boston scale was 6/9 Inadequate bowel preparation was noted in 42.6%. Adherence to the residue-free diet was significantly better in the experimental group compared to the control group (88% vs. 41%; p: 0.002). The mean time between the last intake of the laxative solution and the performance of colonoscopy was significantly shorter for patients in the experimental group than for those in the control group (p: 0.035). The experimental group had a significantly higher proportion of good quality bowel preparation than the control group (77% vs 46%, p=0.04). The median total BBPS score was also significantly higher in the experimental group (7 vs 5, p=0.007).

**Conclusion:** An intensive patient education program 5 days and the day before the exam can significantly improve the quality of bowel preparation for colonoscopy.

**Keywords:** Colonoscopy, Bowel preparation, Educational program

## The role of Z-POEM in the therapy of Zenker´s diverticul – single center experience

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**Aims:** Standard treatment for Zenker´s diverticula (ZD) is endoscopic septotomy. Per oral endoscopic myotomy for ZD (Z-POEM) introduced in 2016 seems to be safe and effective alternative according to published data.

**Methods:** This is a prospective review of a single center case series of patients with ZD treated with Z-POEM. Symptomatic outcome and endoscopic follow up was evaluated 3 months after procedure and afterwards with the median follow-up time of 12 months.

**Results:** 11 patients with ZD (size 1 cm to 5 cm) were included. Z-POEM was successfully performed in all patients, with no complications in periprocedural period. We observed a significant reduction of Kothari-Haber score in 8 patients. There was no change of Kothari-Haber score in one woman with history of three failed total endoscopic septotomies. Two male patients with diverticula size 4 cm and 5 cm respectively had non-significant reduction of score, although they were satisfied with results of Z-POEM. Endoscopy verified persistence of mucosal sack with size 1 cm, 2 cm and 3 cm respectively in place of original ZD in these patients.

**Conclusion:** Z-POEM is a new approach in management of ZD. We demonstrated its safety. Efficiency and ability to provide symptom reduction is in close relation to size of diverticula. According to our experiences with endoscopic septotomies (118 septotomies in 104 patients) that are safe and effective in ZD of any size we think that Z-POEM is more expensive and more complicated alternative. In patients with deeper diverticula (size>2 cm) is higher risk of persistence of mucosal sack after Z-POEM, that is responsible for residual symptoms. Z-POEM after failure of total endoscopic septotomy may not be effective, because all muscles in septum were cut in standard procedure and re-scarring in submucosal space may be present even after Z-POEM. Multicentric studies on larger cohorts of patients and with longer follow-up time are required to confirm these results.

**Keywords:** Z-POEM, Endoscopic septotomy

## Real-time optical diagnosis of colorectal polyps using virtual chromoendoscopy: Could self-trained and experienced endoscopists achieve high accuracy?

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**Aims:** Currently, endoscopy societies allow expert endoscopists only to use real-time optical diagnosis of colorectal polyps to replace pathological analysis. However, we believe that the adoption of optical diagnosis strategies should be generalized to all endoscopists. Therefore, we aimed to assess the efficacy of virtual chromoendoscopy (VC) in the diagnosis of colorectal polyps in the hands of self-trained and experienced endoscopists and to investigate the factors potentially associated with diagnostic accuracy of VC.

**Methods**: A prospective study including patients who presented to the endoscopy unit for colonoscopy and who had (a) polyp(s) being characterized by VC was conducted. The diagnostic performance of VC in differentiating neoplastic from non-neoplastic lesions was assessed with reference to pathological diagnosis. Self-trained endoscopists with at least 2 years of regular practice with VC were selected to participate in this study.

**Results:** Sixty-four polyps with a mean size of 8 mm [2–30] were included in our study, 25 of which were non-neoplastic versus 39 neoplastic polyps. The diagnostic accuracy of VC in neoplastic lesion differentiation was 94%. Sensitivity (Se), Specificity (Sp), positive predictive value (PPV) and negative predictive value (NPV) were respectively 94.9%, 92%, 94.9% and 92%. After stratification by type of VC used, polyp size, polyp morphology, polyp location, pathology and quality of bowel preparation, the present study revealed no predictor of diagnostic accuracy of VC.

**Conclusion:** Virtual chromoendoscopy in the hands of self-trained and experienced endoscopists seems accurate for characterization of colorectal polyps, regardless of the type of VC used or the polyp characteristics.

**Keywords:** virtual chromoendoscopy, NBI, colorectal polyp

## The privilege of I-SCAN over Conventional Endoscopy in the diagnosis of Portal Hypertensive Gastropathy

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**Background:** Endoscopic imaging of Portal Hypertensive Gastropathy (PHG) depends on white light endoscopy (WLE) as a routine technique. WLE may miss some lesions and may cause misinterpretation of findings, thus leading to delayed or inefficient therapeutic modalities. PHG being a flat lesion makes virtual chromoendoscopy a helpful method for its diagnosis.

**The aim** was to assess the privilege of I-SCAN over conventional WLE in the diagnosis of PHG among chronic liver disease patients.

**Method:** One hundred fifty-three patients with cirrhosis and portal hypertension were examined endoscopically to detect diagnostic criterion of PHG (mosaic pattern and/or red spots) with both WLE and I-SCAN modes (1, 2 &3) then the results were compared and analyzed statistically.

**Results:** All I-SCAN modes (1, 2 &3) showed statistically significant difference against WLE in detection of mosaic pattern in fundus of the stomach ($P<0.001$) with both I-SCAN 1 &2 having the highest true positive rate (95.3%). I-SCAN 2 was the best mode to detect mosaic pattern compared to WLE and other I-SCAN modes with sensitivity 95.3%, specificity 51.9% and accuracy 87.7%. Regarding red spots detection, I-SCAN 2 was the only mode to have statistically significant difference against WLE. Although, I-SCAN 3 had the highest true positive rate (75.6%) versus (69.3%) for I-SCAN 2.Both I-SCAN 2 &3 shared sensitivity value 100% but regarding the specificity I-SCAN 2 got 52.8% against 39.6% for I-SCAN 3. I-SCAN 3 detected more positive cases with red spots of PHG (72.1%) than WLE and other I-SCAN modes. Regarding the severity both I-SCAN 2 &3 detected the same number of cases with severe red spots (16.9%).

**Conclusion:** I-SCAN 2 is considered a better visualizing modality for PHG criteria (mosaic pattern & red spots) in gastric mucosa. Combining magnification technique with I-SCAN could enhance the diagnostic ability depending on the gastric mucosal pit patterns.

**Keywords:** Endoscopy, PHG, I-SCAN, Chromoendoscopy

## GERD and its Association with BMI in Adult Patients Undergoing Upper GI Endoscopy at the Kenyatta National Hospital

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**Background:** Gastroesophageal reflux disease (GERD) is a common clinical problem. GERD is highly prevalent in morbidly obese patients and a high body mass index (BMI) is a risk factor. There is an increase in obesity in the black population in Kenya and in the number of patients presenting with GERD symptoms. It is important to look at the impact of BMI on GERD and esophageal mucosal changes as it will guide future management.

**Aim:** To determine the association, if any, between high BMI, a marker of obesity and GERD and to document the esophageal mucosal changes in these patients.

**Methodology:** We conducted a cross-sectional study at Kenyatta National Hospital. Adult patients presenting with classical symptoms of GERD were enrolled. A questionnaire was administered with demographic data (age, gender, weight, height) and specific questions assessing for GERD. At endoscopy, the mucosal changes were recorded. Chi-square analysis was applied for categorical variables. A p-value of <0.05 was considered statistically significant.

**Results:** This was an analysis of 174 patients (56.9% Female, 43.1% Male) between ages 18–80 years ($\tilde{x}$=43) who underwent endoscopy. The BMI ranges were 14.5 to 38.6 Kg/m$^2$ ($\bar{x}$=26.6 Kg/m$^2$). The proportion of patients who were overweight was 40.2% and obese patients made up 21.8% of the population. There was no significant association between BMI measurements and frequency scale of GERD (FSSG) symptoms (p=0.217). During endoscopy, 35.6% of the patients had esophagitis (LA-A -28.7%, LA-B – 6.9%). Hiatal hernia was diagnosed in 20.7% of the patients. There was no significant association between the diagnoses of esophagitis and hiatal hernia and the BMI status of the patients. However, older age was associated with a higher prevalence of hiatal hernia (p=0.002).

**Conclusion:** There was no association between increasing BMI and frequency and severity of GERD symptoms in the study population.

**Keywords:** Gastroesophageal reflux disease, Body Mass Index, Endoscopy.

## Acute pancreatitis as a complication of Endoscopic Ultrasound without Fine Needle Aspiration

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**Aim:** report a rare complication of Endoscopic Ultrasound EUS without Fine Needle Aspiration FNA.

**Method:** 38-year-old Egyptian lady who underwent EUS without FNA, because of Gall Bladder Stones and mild rise in bilirubin, EUS showed normal Common Bile Duct and intra hepatic biliary ducts, 6 hours post procedure the patient had sever epigastric pain, after clinical, biochemical and radiological work up, the patient diagnosed as acute pancreatitis.

**Result:** 2 cases published before about post EUS without FNA pancreatitis, as all the other causes of acute pancreatitis excluded in our patient and due to time frame, the only possible reason for acute pancreatitis is EUS induced.

**Conclusion:** acute pancreatitis can occur in patient underwent EUS even without FNA.

**Keywords:** pancreatitis, EUS, FNA, endoscopic, complications

## Percutaneous Endoscopic Gastrostomy tube insertion in patient with Situs Inversus Totalis

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**Aim:** To confirm that the Percutaneous Endoscopic Gastrostomy (PEG) insertion does not lead to an extraordinary complication in patients with Situs Inversus Totalis (SIT).

**Methods:** We performed PEG insertion in an 85-year-old Qatari male, diagnosed recently as SIT, who was admitted to the hospital as a case of aspiration pneumonia on a nasogastric feeding tube (NGT). The procedure started while the patient in the left lateral position as in normal anatomy patients, radiological imaging used to identify the exact location of internal organs before the procedure, the tube inserted by pull technique.

**Result:** there were neither intra-operative nor postoperative complications.

**Conclusion:** PEG tube can be safely inserted in patients with SIT if the pre-operative anatomical position of vital organs is carefully evaluated and general principles of PEG insertion are followed.

**Keywords:** Gastrostomy, feeding, SIT, enteral, endoscopic

## Ovesco clip utility (OTSC: over the scope clip) in variceal bleeding refractory to band ligation

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**Objectives:** Demonstrate through this clinical case, the effectiveness of the use of the ovesco clip as a salvage measure in cases of variceal hemorrhage refractory to band ligation.

**Introduction:** The ovesco clip (OTSC) is used in cases of digestive perforation, fistula, anastomotic dehiscence and non-variceal bleeding. 1; its use as a tool for variceal bleeding refractory to conventional treatment is discussed

**Presentation:** 65-year-old woman, with a history of liver cirrhosis (Child Pugh C), diabetes mellitus, with ligation of esophageal varices on two previous occasions. He was admitted due to abundant hematemesis of 24 hours of evolution, paleness, sweating, tachycardia, hypotension, grade II encephalopathy; the blood tests showed: Hb 9g / dl, platelets 65,000 xmm3, albumin 3g / dL, total bilirubin 2.3 mg / dL, INR 1.9; abdominal ultrasound revealed mild ascites. After stabilization, VEDA was performed, showing variceal bleeding, proceeding to perform band ligation; however, 48 hours later he presented new bleeding with hemodynamic instability. After the respective treatment, the second VEDA revealed stigmata of recent bleeding and the absence of a band on the ulcerated varix, for which he decided to place an ovesco clip, with which the bleeding was definitively controlled. The patient was discharged five days later, with a current follow-up of 8 weeks without rebleeding.

**Discussion:** The ovesco clip is not a standard treatment for variceal bleeding; Clinical cases have been described on its use in refractory variceal bleeding, with high effectiveness, as in this case, obtaining good results.

**Conclusions:** The ovesco clip proved to be effective in this case of refractory variceal bleeding, in the context of possible fibrosis related to the history of two previous variceal ligation sessions. Prospective studies are required to determine long-term effectiveness.

**Keywords:** endoscopic band ligation, endoscopic therapy, OTSC, variceal bleeding

## Evaluation of the knowledge of endoscopic disinfection of resident doctors in gastroenterology

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Various recommendations of good practice from both learned and professional societies, have been published to minimize the risk of infection related to digestive endoscopy.

**Aims:** The purpose of this work is to evaluate the knowledge of gastroenterology resident doctors through a quiz on endoscopic disinfection.

**Materials and methods:** This is a prospective study carried out over 1 month through a self-evaluation quiz (Google Forms) including the main points of disinfection (cleaning, products and contact time for disinfection, protection of personnel) addressed to gastroenterology residents, anonymously and scored on 20 points.

**Results:** 44 resident doctors completed the quiz with a mean age of 27 years (+/- 1.5). 33 residents (75%) had no prior training in the endoscopic disinfection circuit.

The number of resident doctors who have already disinfected an endoscope is 25 (57%).

The result of the score is as follows: 6 resident doctors had a score of 10 (14%), 10 resident doctors had a score > 10 (22%), and 28 resident doctors had a score < 10 (64%).

The resident doctors who had ever disinfected an endoscope had a higher score than those who had never disinfected an endoscope 11/20 vs 6/20 (p=0.000).

**Conclusion:** Disinfection knowledge remains to be improved. The passage in circuit of disinfection and the practice of a procedure of disinfection has a positive impact on the control of the process.

## Influence of instrumental revision of the common bile duct on the timing of hyperamilasemia regression in patients with ERCP-induced pancreatitis

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**Aim:** To assess the timing of hyperamilasemia regression in patients with ERCP -induced pancreatitis, depending on the method of cleaning of the common bile duct.

**Materials and methods:** A retrospective analysis of the medical data of patients with cholelithiasis who underwent papillotomy and who were diagnosed with hyperamilasemia in the early postoperative period was carried out. The study included 47 patients. 37 women (78.72%), 10 men (21.28%). The average age was 57.98 ± 16.67. Patients are divided into 2 groups depending on the method of cleaning of the common bile duct. Group 1 – revision of the common bile duct by Dormia basket – 13 people (27.66%), group 2 – patients without revision of the common bile duct, taking a choleretic drug – 34 people (72.34%). The dynamics of the regression of hyperamilasemia in days to normal values was assessed.

**Results:** The average time for normalization of the amylase level in patients with revision of the common bile duct was 3.38 days, without revision of the common bile duct (prescription of choleretics) – 3.20 days. Univariate analysis revealed significant differences in the timing of regression of hyperamilasemia ($F = 24.26036$, $p = 0.001703$). Regression analysis showed the dependence of the timing of regression of hyperamilasemia on the fact of revision of the common bile duct by the Dormia basket ($B = 3.059925$, $p = 0.008468$)

**Conclusion:** Revision of the common bile duct by Dormia basket (as a damaging mechanical factor) can affect the timing of regression of hyperamilasemia after papillotomy.

**Keywords:** ERCP-induced pancreatitis, hyperamilasemia, instrumental revision

## Interim assessment of the method for the prevention of ERCP-associated pancreatitis

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**Aims:** To evaluate the effectiveness of the method for the prevention of ERCP-associated pancreatitis

**Material and methods:** Single-center continuous prospective study. Medical data of 484 patients who were treated with complicated choledocholithiasis and underwent papillotomy in 2015-2020 were analyzed. At random, 363 of them used the method of preventing pancreatitis. After papillotomy in the postbulbar section, submucosal infiltration with 10 ml of 0.5% solution of novocaine or lidocaine was performed.

**Results:** Assessment of the total number of complications by the logistic regression method showed that the method was associated with a large number of complications (standardized remainder of 0.588, p = 0.04). Evaluation of the influence of the method on specific complications revealed a positive effect on bleeding (standardized residue -1.377, p = 0.13), mild pancreatitis (standardized residue -0.843, p = 0.37), severe pancreatitis (standardized residue -0.321, p = 0, 64), and an association with perforation (standardized residue +0.253, p = 0.81). Multivariate analysis showed a significant effect of the method on reducing the frequency of post-manipulative pancreatitis (F = 106.330, p = 0.002).

**Conclusion:** Further evaluation of pancreatitis prevention method is needed

**Keywords:** ERCP-associated pancreatitis, prevention

## Preliminary endoscopic assessment of the effect of rebamipide on ulcers and erosion in Siberia

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**Aim:** In Asia, rebamipide is superior to proton pump inhibitors (PPIs) in ulcerative lesions of the gastrointestinal tract. We wanted to evaluate the effect of rebamipide on the course of peptic ulcer in a large industrial city in Siberia.

**Material and methods:** In 2018-2020, twenty patients with endoscopically confirmed peptic ulcer and exacerbation of chronic erosive gastritis, in addition to PPIs or eradication therapy, received rebamipide at a dosage of 100 mg 3 times a day for 28 days. The comparison group consisted of 34 similar patients treated without rebamipide. Endoscopy was performed every 10 days.

**Results:**

Ulcer healing times were 16.67 ± 2.933609 days versus 25.70000 ± 6.720746 days in the comparison group (ANOVA Chi Sqr. (N = 12, df = 1) = 5.333333 p <0.02092, Coeff. of Concordance = 0.44444 Aver.rank r = 0.39394). The timing of epithelialization of chronic erosions (regression of acute inflammation) was 11,500 ± 2,267787 days versus 12.07 ± 2,786348 days in the comparison group (ANOVA Chi Sqr. (N = 8, df = 1) = 0.2000000 p <0, 65472, Coeff. Of Concordance = 0.02500 Aver.rank r = -0.1143).

**Conclusion:** The use of rebamipide in a complex of treatment can be effective in peptic ulcer disease. We did not find any convincing advantages of rebamipide in patients with chronic erosive gastritis.

**Keywords:** peptic ulcer, chronic erosive gastritis, rebamipide

## Differential diagnostics and long-term prognosis of non-atrophic duodenal changes in children undergoing esophagogastroduodenoscopy with systematic biopsy sampling

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**Aims:** Morphological changes of the duodenal mucosa are common and usually caused by celiac disease. However, the increased use of esophagogastroduodenoscopy (EGD) with systematic sampling frequently identifies various non-morphologic abnormalities with unclear significance. We investigated the prevalence and diagnostic outcomes of these changes in a large pediatric cohort.

**Methods**: Comprehensive medical data of 1170 consecutive children who had undergone EGD with duodenal biopsy were collected. Baseline clinical features and diagnostic outcomes were compared between children with non-atrophic changes and normal histology, and between those with non-atrophic changes who did and did not receive a diagnosis. Follow-up data was available up to 13 years.

**Results**: Fifty-one (4.4%) children had non-atrophic changes, particularly nonspecific inflammation and intraepithelial lymphocytosis, and 804 (95.6%) normal histology. The former presented more often with hematochezia (23.5% *vs.* 11.3%; p=0.009), anemia (43.2% *vs.* 36.5%; p=0.028) and positive celiac serology (34.3% *vs.* 12.9%; p<0.001). In addition, 24 (44%) of them received an initial diagnosis, the most common of which were inflammatory bowel disease (IBD), food allergy and *Helicobacter pylori* -infection. Those receiving a diagnosis had more often hematochezia (37.5% vs. 11.1%; p=0.027) and anemia (70.6% vs. 20.0%; p=0.002) and less often positive celiac serology (7.7% vs. 50.0%; p=0.013). Of those 27 with non-atrophic changes and no initial diagnosis, 5/12 initially seropositive children developed celiac disease later and one also ulcerative colitis. None of the remaining 15 children with negative celiac disease serology received a later diagnosis.

**Conclusions**: Non-atrophic duodenal changes are relatively common, particularly in children with IBD and those presenting with hematochezia, anemia and positive celiac serology. Excluding potential celiac disease, those without an initial diagnosis have a favorable long-term prognosis.

**Keywords:** Esophagogastroduodenoscopy, Histology, Duodenum, Children

## Lateral/panoramic video capsule endoscopy system for small bowel diseases detection: a retrospective study

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**Aims**: To present our experience in the investigation of small bowel diseases (SBD) using a lateral/panoramic imaging SBCE. In this regard, CapsoCam Plus (Novinium®) comprises the first wireless capsule that incorporates a large-capacity onboard storage system to completely eliminate the need for external receiver equipment (adhesive patches or belt). It provides a full 360º panoramic direct lateral view, captures 20 frames per second, with 4 cameras arranged on the mid body of the capsule.

**Methods**: Fifty-four patients were recruited and submitted to SBCE in our Department between March 2017 and August 2020. Indications included iron-deficiency anaemia (34), obscure gastrointestinal bleeding (6), chronic diarrhoea (2), malabsorption syndrome (3) and suspected/known Crohn's disease (9). Patients with the presence of an imaging-confirmed or suspected stenosis of the gastrointestinal tract were excluded.

**Results**: Fifty-two patients were finally enrolled; 28 male and 24 female patients (mean age: 56 years). The mean transit time for the small bowel was 5 hours and 23 minutes (range 45 minutes-11 hours) while the median recording time (battery function duration) was 17 hours. Capsule was not returned in two cases. CapsoCam revealed the following findings: no mucosal lesions (25), endoscopic image of celiac disease (2), typical lesions of Crohn's disease (7), active bleeding without revealing the cause of bleeding (2), angiodysplasias or erosions (14) and tumor (2).

**Conclusions**: Although our study did not provide any direct comparison, relative reports indicated that lateral/panoramic SBCE represents a reliable alternative to axial SBCE for the examination of SBD. The wireless onboard storage design with no need of external receiver equipment optimizes patients' convenience.

**Keywords:** Wireless capsule endoscopy, small intestine

## Upper gastrointestinal bleeding: a prospective epidemiological study

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**Aims:** Upper gastrointestinal hemorrhage (UGIH) is a common medical condition that results in substantial morbidity and mortality. The objective of this work is to study the epidemiological profile of UGIH in our department.

**Methods:** A prospective descriptive study including patients admitted for UGIH from January to December 2020. All patients received specific management included upper endoscopy. We collected epidemiological, etiologies and endoscopic data.

**Results:** The study included 72 patients with UGIH, 31 males (43.1%) and 41 females (56.9%), sex ratio (F/M)=1.2. 17 patients (23.28%) presented with hematemesis, 25 patients (34.24%) presented hematemesis and melena, 29 patients (39.72%) presented melen and 8 patients (10.95%) presented rectal bleeding. The mean age was 56.5+-6.8. 14 patients were <40 years (19.4%), 17 patients between 40-60 years (23.6%) and 41 patients >60 years (56.9%). patient's Medical History were: portal hypertension (PHT) in 10 patients (13.7%), known gastrointestinal ulcer in 3 patients (4%), antiplatelet therapy in 10 patients (13.7%), anticoagulants in 8 patients (11%). The average time to perform gastroscopy was 36.97 h +- 8.9. The main diagnoses were bleeding on esophageal varices in 13 patients (17%), gastrointestinal ulcer in 23 patients (31.5%), gastric tumor process in 4 patients (5%), gastric angiodysplasias and peptic esophagitis in 5 patients each (6.8%) and normal gastroscopy in 12 patients (16%). Endoscopic hemostasis was performed by variceal ligation in 11 patients (15%), APC (6%), application of clips (3%), biological glue injection and hemostatic spray (1%).

**Conclusion:** The majority of upper GI bleeding occurred in patients over 60 years of age in our series. Upper endoscopy is the key examination and is the main step for diagnostic and therapeutic purposes. The most common etiologies are ulcer disease and portal hypertension-related bleeding. Specific management varies according to the causative lesion and prognosis has been improved by rapid and effective management.

**Keywords:** Upper gastrointestinal hemorrhage, Epidemiological, Endoscopic diagnosis, Management

## ERCP using a short guidewire

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**Aims:** The aim of this work is to present the ERCP using combination of short guidewire and instruments designed for the long-wire system and retrospective analysis of safety, practicality, duration of the procedure and cannulation success rate.

**Methods:** Nearly five years retrospective analysis of ERCP parameters using short guidewire and instruments for long-wire system.

**Results:** From the beginning of 2016 to September 2020 were performed 1408 ERCPs. We used the short guidewire in 80% (2016), 95% (2017) and since 2018 in 100% of procedures. The principal of short-wire ERCP system is locking a short guidewire in position which allow using devices without displacement of the wire. Suitable are devices dedicated for short guidewire. Our work shows the possibility of using also instruments designed for the long-wire system. The wire itself is controlled by the nurse during cannulation, but thanks to guidewire length are similar procedures up to a third of the time shorter. Our cannulation success rate is 97%. We noticed 5 perforations (0,36%), one patient was operated. The incidence of post-ERCP pancreatitis was 2%. The sum of the lengths of the bile ducts, the working channel and the free part of the inserted instrument shows that the short guidewire length (260 cm) is sufficient due to internal and external locking devices.

**Conclusion:** The short-wire system reduces the side effects of ERCP by reducing cannulation and procedure times, fluoroscopy time, sedation requirements, improving wire stability and physician control of the wire. We use complete short-wire system and combination of a short guidewire and tools for a long-wire method due to V systems and RX locking systems and procedures seems to be similar. In the future, we want to combine these two techniques. Long guidewires are not necessary. This year we organized the first workshop on this topic.

**Keywords:** ERCP, guidewire, short-wire system, long-wire system, locking system

## Application of a predictive model of organic dyspepsia in subjects referred from primary care for Upper Digestive Endoscopy in the northern area of Santiago, Chile

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**Introduction and objective:** Due to the healthcare pandemic context, numerous endoscopic procedures have not been performed. A predictive clinical model that allows finding organicity could be helpful in prioritization. **Objective:** Apply a predictive model of organic dyspepsia in subjects referred to Upper Digestive Endoscopy (UDE) from Primary Care.

**Method:** Descriptive study. UDE was performed on patients on the waiting list from the communes of Huechuraba and Recoleta, Santiago, Chile, between August and December 2020. A predictive clinical model described by Barenys et al. (score greater than 6, a predictor of organicity) was used; the urease test and Sydney protocol were performed according to national guidelines (ACHED 2014).

**Results:** 537 scheduled patients. 498 surveys were applied. The most frequent endoscopic diagnosis was erosive gastropathy (17%) and risky findings OLGA III-IV: 6% and OLGIM III-IV: 2%. Score greater than 6 and pathological findings (ulcers, esophagitis, and organic dyspepsia) were evaluated with Sensibility 38% and Specificity 63%. A score out of 6 has Sensibility 31% and Specificity 65% for OLGA III-IV.

The two patients with neoplasia in the series had a score of 4 and 3 points, respectively.

**Conclusion:** The score out of 6 in the predictive model of organized dyspepsia presented lower sensitivity and specificity than in the referenced work, nor was it related to a greater degree of intestinal atrophy or metaplasia in this survey. In our population, a prevalence of intestinal atrophy and metaplasia was found similar to other reported series.

Validating a national predictive clinical model that allows prioritization is a necessity in our environment, with limited resources.

**Keywords:** Application, Predictive model, Organic dyspepsia

## Ileal Dieulafoy's lesion

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**Introduction:** Dieulafoy's lesions (DLs) are dilated aberrant submucosal vessels, otherwise histologically normal, that erode the overlying epithelium in the absence of a primary ulcer, thereby causing a massive gastrointestinal (GI) bleeding. Despite being initially described by Dr. M.T. Gallard in 1884 as gastric aneurysm, the nomenclature for this lesion is attributed to Georges Dieulafoy in 1898, who considered it to be the initial stage of a common gastric ulcer. We herein describe the rare case of an elderly patient with severe hematochezia, dizziness, and instability of vitals due to a DL located in the ileum.

**Case report:** An 85-year-old man was transferred to the Accident and Emergency Unit of our hospital after he collapsed due to several episodes of voluminous fresh hematochezia. On admission, the patient felt dizzy, his blood pressure was 90/56 mmHg, and his pulse rate was 108 beats/min. On general physical examination he looked pale and dehydrated. Blood hemoglobin level was 6.5 g/dL. He had a history of heart failure, mitral regurgitation, hypertension, paroxysmal atrial flutter, and was receiving treatment with acenocoumarol. The patient did not report any use of aspirin or nonsteroidal anti-inflammatory drugs (NSAIDs) in the previous 7 days. Family history was negative for any GI disease.

Initially the patient was treated with a transfusion of 3 units of packed red blood cells, and thereafter he underwent an urgent esophagogastroduodenoscopy (EGD), which was unrevealing for a bleeding site. After he became hemodynamically stable, a colonoscopy was performed, which revealed fresh blood throughout the entire colon and terminal ileum. A DL on the distal ileum, approximately 10 cm from the ileocecal valve, was found and immediate hemostasis was successful using hemoclips. On the fifth day post-endoscopic intervention, there were no signs of recurrent bleeding and the patient was discharged from our hospital.

**Keywords:** ileal Dieulafoy's lesion

## Colorectal adenomatous polyp surveillance, are we getting it right? A single centre retrospective study

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**Introduction:** Identifying colonic polyps can reduce mortality through both earlier diagnosis of colorectal cancer (CRC) and polypectomy. Following the finding and removal of colonic adenomas, some patients are at an increased risk of developing CRC. This has led to post-polypectomy surveillance colonoscopy with the development of associated national guidelines.

**Aim:** To retrospectively review whether surveillance colonoscopy requests (SCR), following the removal of colorectal adenomatous polyps, adhere to national guidelines.

**Method:** This was a retrospective, single centre case review series. The SCR of patients with a histological diagnosis of colorectal adenomatous polyps between 2013 to 2018 were reviewed using electronic patient records. Index endoscopy reports were reviewed. Polyp number and size were noted. Appropriateness of SCR was determined using existing guidelines.

**Results:** 177 patients were identified. Overall 55.9% of SCR were made in accordance with the guidelines.

For the 44.1% of patients with SCR in the incorrect time interval, 64.1% of requests were earlier than recommended (mean 1.87 years early). In the 39.9% of patients with requests made late, the mean delay was 1.46 years.

In the sub-analysis, 73.8% of the low-risk category had appropriate requests but 55.9% of the intermediate group were requested in the incorrect time interval. In the high-risk category 35.7% of requests were incorrectly made, with **all** of these requests later than recommended in the current guidelines.

**Conclusion:** Nearly half of the patients had SCR made for an inappropriate time interval, the majority placed earlier than recommended. Colonoscopy with or without polypectomy is an invasive procedure with associated risks. We recommend better implementation and education of surveillance guidelines to ensure optimum outcomes for patients and a reduction in the burden on endoscopy services. Subsequently we have introduced consultant gastroenterologist vetting of SCR; further investigation is required to demonstrate an improvement in adherence to guidelines.

**Keywords:** Colonoscopy, Colorectal Cancer, Polyp

## A comparative study of colonoscopic preparation with 1L PEG + ascorbic acid vs magnesium citrate + sodium picosulphate (MCSP) in real clinical practice: effectiveness and safety

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**Aims**: Inadequate bowel preparation reduces colonoscopy diagnostic yield. Preparations based on polyethylene glycol (PEG) and MCSP are first-line options. This study compares the effectiveness and safety of low volume 1L PEG + Ascorbic Acid (1L PEG+A) versus MCSP.

**Methods**: Systematic and prospective registry of outpatients prepared with 1L PEG+A versus MCSP. Efficacy was evaluated with Boston Bowel Preparation Scale (BBPS) in total and right colon, Polyp Detection Rate (PDR), tolerance and safety.

**Results**: Between July 2019–July 2021, 775 patients were included, 383 in 1L PEG+A and 392 in MCSP. Mean age 58 years [18-85]. BBPS in total colon was >6 in 92% and >7 in 76% in 1L PEG+A and >6 in 78% and >7 in 50% in MCSP ($p<0.01$). In right colon, BBPS>2 in 92% and BBPS=3 in 58% in 1L PEG+A and BBPS>2 in 83% and BBPS=3 in 25% in MCSP ($p<0.01$). Tolerance in MCSP and 1L PEG+A group was good in 89% and 82% and bad in 11% and 18% respectively ($p> 0.05$). PDR was 42% and 48% in MCSP and 1L PEG+A, respectively ($p> 0.05$). 3% presented vomiting with MCSP and 11% with 1L PEG+A ($p <0.01$). 7% had nausea with MCSP and 3% with 1L PEG+A ($p> 0.05$). 3% of the patients in 1L PEG+A had sodium levels > 147 mg /dl, all asymptomatic. 10% of the patients in MCSP had sodium levels < 135 mg /dl. 10 women > 65 years had values < 130 mg/dl (one required emergency admission).

**Conclusions**: Preparation with 1L PEG+ A obtains optimal and high-quality bowel preparation compared to MCSP. Vomiting does not seem to affect the final efficacy of 1L PEG+A. In MCSP group, 5 cases of hyponatremia with clinical relevance were detected, which could make us assess changes in its use in patients over 65 years.

**Keywords:** 1L PEG+Ascorbic Acid, Magnesium citarte + sodium picosulphate, Colonoscopic preparation, Effectiveness, Safety

## Effectiveness and tolerability of the colonoscopic preparation with 1L PEG + ascorbic acid vs magnesium citrate + sodium picosulphate in real clinical practice in elderly patients

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**Aims**: The increase in life expectancy in our environment is leading to an increase in colonoscopies in elderly patients. Inadequate intestinal cleansing is significantly more common in these patients, so colonoscopy is considered more challenging than usual due to the difficulty of preparation in the elderly population. We evaluate the effectiveness and tolerability of low volume 1L polyethylene glycol (PEG) + ascorbic acid (1L PEG + A) versus Magnesium Citrate + Sodium Picosulphate (MCSP) in patients ≥ 65 years old.

**Methods**: Post-hoc analysis of a systematic and prospective registry of outpatients prepared with 1L PEG + A and MCSP in patients ≥ 65 years old. Effectiveness was assessing with Boston Bowel Preparation Scale (BBPS) in total and right colon, Polyp Detection Rate (PDR) and tolerance.

**Results**: Between July 2019–July 2021, 245 patients ≥ 65 years old were included, 144 in 1L PEG+A and 111 in MCSP. BBPS in total colon was >6 in 94% and >7 in 81% in 1L PEG+A and >6 in 68% and >7 in 41% in MCSP ($p<0.01$). In right colon, BBPS>2 in 93% and BBPS=3 in 62% in 1L PEG+A and BBPS>2 in 73% and BBPS=3 in 23% in MCSP ($p<0.01$). Tolerance in MCSP and 1L PEG+A group was good in 79% and 84%, fair in 7% and 5% and poor in 14% and 10% of the patients respectively ($p> 0.05$). 10 women in MCSP group had values < 130 mg/dl (one required emergency admission).

**Conclusions**: Preparation for colonoscopy with 1L PEG+A achieves better optimal and high-quality bowel preparation compared to MCSP in patients > 65 years. Hyponatremia with clinical relevance were detected in MCSP group, which could make us assess changes in its use in elderly patients. These results confirm the efficacy and tolerability of PLEINVUE® in elderly patients in real clinical practice.

**Keywords:** 1L PEG + Ascorbic acid, Magnesium citarte + Sodium picosulphate, Elderly patients, Effectiveness, Safety

## Endoscopic findings and emerging complications after ingestion of corrosive substances

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**Aim:** To evaluate the most commonly ingested corrosive substance, endoscopic findings, complications and the final outcome of caustic intake.

**Methods**: This cross sectional study covered 220 inpatient participants during a three years period (2017-2019). Data from the National patient electronic system “My term” and from the “Poisoning information center” at University Clinic of Toxicology, Skopje were used. Demographic characteristics, type of corrosive substance, endoscopic findings – Kikendall classification, emerging complications, fatal outcome, and hospitalization were analyzed.

**Results:** Out of 220 inpatient cases with corrosive substance intake, there were acids 60% (n=132), bases 8.6% (n=19), bleaches 14.5% (n=32) and other household products 16.8% (n=37). Patients which took acids/bases were significantly older compared to bleaches/other (p=0.0009). Hospitalization was significantly longer in base and acid ingestion compared to bleaches and other (p=0.0005). Upper gastrointestinal endoscopy was declined by 10% (n= 22) and 10% (n=22) of patients were with fatal outcome. The most severe endoscopy findings were in acid and base ingestion. Esophagus findings in acids -grade I (1.92%), grade IIA (50%), grade IIB (27%) and grade III (21.1%), in bases – grade IIA (7.2%), grade IIB (57.1%) and grade III (35.7%); Stomach findings in acids-grade I (2.9%), grade IIA (29.8%), grade IIB (37.5%), grade III (29.8%), in bases-grade IIA (13.4%), grade IIB (33.4%), grade III (53.2%); Duodenum findings in acids-grade I (62.5%), grade IIA (23.1%), grade IIB (14.4%), in bases-grade IIA (26.7%), grade IIB (40%), grade III (33.3%). In 22.2% (n=39) of cases were registered complications (strictures): esophagus 43.6% (n=17), stomach 25.7% (n=10), on both organs 30.8% (n=12).

**Conclusion:** Corrosive substances result in serious injuries to the mucosa of the gastrointestinal tract, which are confirmed by endoscopic findings. These conditions are often accompanied by complications such as strictures and can lead to fatal outcomes as well.

**Keywords:** corrosive substance, Kikendall classification, strictures, hospitalization

## Applicability of the Glasgow-Blatchford score in predicting low-risk patients with upper gastrointestinal bleeding – first data from the Czech Republic

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**Aims:** Upper gastrointestinal (GI) bleeding is a medical emergency that requires rapid assessment and dynamic management. In many hospitals emergency endoscopy (a crucial part of the diagnostic and therapeutic process) is not easily available around the clock. The Glasgow Blatchford score (GBS) predicts the outcome of patients at present. European guidelines recommend outpatient management for a GBS of 0 or 1. The aim of our study was to validate the applicability of GBS on a population of Czech patients and to evaluate whether extending the GBS allows for early discharge while keeping the patient safe.

**Methods:** Retrospectively collected data of patients who were hospitalised and underwent gastroscopy in the endoscopy ward of Boskovice Hospital for symptoms of upper GI bleeding between October 2018 and December 2019.

**Results:** Data based on the overall course of the disease suggest that the optimal GBS for determining a low-risk patient is 3, but concerning the endoscopic findings, GBS ≤ 2 should be considered safe for outpatient management. A GBS ≥ 10 predicts a severe overall course of the disease and a severe endoscopic finding.

**Conclusion:** According to our data, the GBS could be extended to 2 for safe outpatient management, which might free up inpatient beds, save costs and reduce the pressure for urgent endoscopies. Further studies with more patients are necessary.

**Keywords:** Glasgow-Blatchford score, Gastrointestinal bleeding, Gastroscopy, Risk stratification

## Peroral endoscopic myotomy (POEM) for achalasia: long-term efficacy and post-poem reflux analysis in a single center study

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**Introduction:** POEM is now a standard method for treatment of achalasia, although the long-term data on efficacy and the clinical impact of post-POEM reflux are not available.

**Aims/Methods:** The aim of this single-center retrospective analysis of prospectively collected data was to assess the long-term clinical outcomes of patients undergoing POEM for achalasia. Consecutive patients who underwent POEM between 12/2012-8/2021 were analyzed. Follow-up visits were scheduled at 3 and 12M after the procedure and yearly thereafter. Gastroscopy, high-resolution manometry and 24-hour pH monitoring were performed 3M; endoscopy was repeated at 2-3 years and 6 years. Main outcomes were treatment success (Eckardt score<3) and post-POEM gastroesophageal reflux (reflux esophagitis, reflux symptoms, 24h pH monitoring, use of proton pump inhibitors– PPIs).

**Results**: 431 patients have undergone 452 POEMs. The overall initial treatment success at 12M was 97% (95% CI 94–98). Follow-up visits at 48, 60 and 72M were completed in 162,111 and 65 patients with treatment success 87% (83–91), 86% (81–90) and 81% (73–86). Treatment failure and recurrence was observed in 6 and 34 patients, respectively**.** At 3M, abnormal acid exposure time was detected in 138/320 (43%) patients, but only 92/397 (23%) patients complained of reflux symptoms. Reflux esophagitis was present in 164/386 patients (42%) at 3M, in 67/186 (36%) at 24–36M and in 11/51 patients (22%) at 6 years follow-up. At 3, 24–36 and 72M after POEM 36%, 48% and 49% of patients were on PPI therapy. None of the patients have developed complications from the reflux.

**Conclusion**: POEM is highly effective in treatment of achalasia with durable treatment success of 81% at 6 years after the procedure. Although the rate of post-POEM reflux esophagitis seems to decrease over time, approximately 50% of patients require long-term antisecretory treatment. Thus, patients after POEM should be under long-term surveillance due to both clinical burden of reflux and recurrence of achalasia.

**Keywords:** POEM, achalasia

## Short-term and long-term results of pneumatic dilation in the treatment of patients with esophageal achalasia: 16 years of experience

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**Background:** Pneumatic dilation (PD) is still a popular treatment of esophageal achalasia. This retrospective analysis informs about our 16 years of experience with pneumatic dilatation in the treatment of patients with achalasia.

**Patients and Methods:** Consecutive patients with achalasia who received endoscopic balloon dilation therapy were analyzed retrospectively. The success of endoscopic pneumatic dilation was defined as no treatment other than pneumatic dilation and the overall clinical Eckardt score had to be ≤ 3 (and at the same time each individual item <2).

**Results:** From January 2004 until December 2019 140 patients with achalasia underwent pneumatic dilation (67 males (47,9%), mean age 54,9 ± 16,2 years). Median follow-up since the first dilation was 125 months (range 6-263 months). Satisfactory results were observed in 130 patients (92,9%). Out of the remaining ten patients, two (1,4%) had periprocedural esophageal perforation and in 8 (5,7%) patients the treatment effect was insufficient. Out of all patients 107/140 (76,4%) had only one PD, 22/140 (15,7%) had two PDs, three PDs were performed in 8/140 (5,7%) and 3/140 (2,1%) patients had 4 PD procedures. Treatment failure was more common in patients who had more pneumatic dilations (1 PD 37,5%, 2 and more PDs 62,5%; p=0,019).

**Conclusions:** Endoscopic balloon dilation, starting with a 35 mm balloon, is an effective treatment for achalasia in the short and long term, with minimal morbidity. The possible incomplete effect of dilation therapy is more often manifested in an earlier period after the initial dilation therapy.

**Keywords:** achalasia, pneumatic dilation, long-term results, complications

## Esophagitis dissecans superficialis in nonsteroidal anti-inflammatory drug user with recurrent vomitus: A case report

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**Aims:** Esophagitis dissecans superficialis (EDS) is an extremely rare esophageal disorder. It has limited known risk factors, distinct clinical manifestations and no specific treatment. This case report demonstrated EDS with recurrent vomitus as presenting symptom in NSAID user.

**Methods:** We reported a 55-year-old man admitted to emergency room with recurrent vomitus since 7 days before admission and preceding nausea and epigastric pain. No fever, hematemesis, melena, and weight loss were reported. No history of allergic/atopic condition. There was history of consuming meloxicam or ibuprofen. No alcohol use, hot beverages, and chemical ingestion were documented. Physical examination revealed considerably normal findings. CBC and blood chemistry were examined. Upper gastrointestinal endoscopy and biopsy were also performed in this case.

**Results:** CBC showed microcytic anemia. Blood chemistry revealed normal range for hepatic enzyme, kidney function test, and coagulation panel test. Serum electrolyte was also normal.

Endoscopic findings demonstrated multiple thin whitish sheets of sloughed mucosa and fragments of stripped-off mucosa in distal part of esophagus. Histopathologic findings showed erosion and discontinuation in squamous epithelium, necrosis and minimal inflammation.

EDS is characterized by sloughing esophagitis as seen in this case. Furthermore, histological findings in this case supported the diagnosis of EDS, including intraepithelial splitting and necrosis. History of NSAID consuming may precipitate EDS in this case.

EDS has no specific treatment. We suggested the discontinuation of NSAID in this case. Proton-pump inhibitor and supportive therapy were administered. Patient underwent clinical improvement with the treatment.

**Conclusions:** EDS is a rare benign esophageal condition necessitating endoscopy and biopsy. Physicians should notify this condition among NSAID users with upper gastrointestinal problems. EDS seemingly has good prognosis.

**Keywords:** esophagitis dissecans superficialis, recurrent vomitus, nonsteroidal anti-inflammatory drug

## FUNCTIONAL DISORDERS

### Administration of a Live Biotherapeutic is associated with Microbiome Structural Changes and the Alleviation of IBS symptomology: Results from Blautix® Phase II RCT

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**Aims**: Gut microbiome modulation using live biotherapeutic products (LBPs) is an emerging therapeutic strategy in IBS. Understanding co-occurrence and inter-microbial interaction is necessary to properly evaluate the role of microbiota in functional disorders such as IBS and to evaluate the effects of LBPs in patients. We report on the co-occurrence network analysis of the microbiome from IBS patients enrolled in the phase-II RCT of Blautix, a therapeutically promising strain of *Blautia hydrogenotrophica* (NCT03721107) which has been shown to be effective in reducing abdominal pain and improving bowel habits in both IBS-C and IBS-D cohorts.

**Methods**: We performed 16S rDNA amplicon sequencing of 949 faecal samples from 260 subjects from 4 treatments groups (IBS-C Blautix, IBS-C Placebo, IBS-D Blautix and IBS-D Placebo) across 4 study timepoints (Baseline; mid-treatment; end-of-treatment; and follow-up). Microbial co-occurrence network analysis was performed using FastSpar, a faster implementation of the SPARCC algorithm.

**Results**: Analysis of microbiota networks and network metrics showed evidence of treatment-associated alterations in microbiota structures. Post treatment timepoints of IBS-C and IBS-D Blautix groups were seen to cluster together and were distinct from Placebo and baseline samples based on the average shortest path network property. Based on node betweenness, the groups clustered according to subtypes and treatment. The *B. hydrogenotrophica* zOTU corresponding to Blautix was observed to have greater connectivity (importance) to the overall network after treatment in networks of Blautix treated sample groups.

**Conclusion**: Observed results show that the co-occurrence network structure of the microbiome evolves after treatment in both IBS-C and IBS-D. Similar alterations were not seen in the Placebo treated groups. Such modulation may influence microbiome functionality, gut environment, or host-microbe signaling to ameliorate gut microbiota mediated exacerbation of functional disorders such as IBS.

**Keywords:** IBS, Live Biotherapeutic, Blautix, Microbiome

## Microscopic esophageal injury contributes to heartburn perception in patients with GERD

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**Introduction:** Heartburn is the most prominent feature of GERD. TRPV1 receptor activated by acid is best described. Intensity of heartburn varies as various pathophysiological mechanisms are involved. Although mucosal integrity plays a key role in the pathophysiology of GERD, its direct involvement in heartburn perception has not been established.

**Methods:** We hypothesized that infusion of noxious stimuli into the esophagus induces heartburn intensity proportionate to the mucosal integrity. TRPV1 activator acid (HCl solution, pH=1,10 min.) was infused (8ml/min.) into the esophagus via a transnasal tube 5 cm above LES. Intensity of sensations was recorded every 2 min. by visual analogue scale (0-10). 12 patients with chronic heartburn were included. All patients had 24 hour pH/impedance off PPI and mean nocturnal baseline impedance (MNBI) value was determined. We analyzed the correlation between MNBI and the dynamics of heartburn perception based on VAS.

**Results:** 12 subjects received acid infusion. Infusion induced heartburn in all patients. Maximal VAS score was 7.1±2.6 (N=12). To avoid the contribution of hypersensitivity we determined the dynamics of heartburn – defined as ratio between intensity of heartburn in the 2. min. of the infusion and maximal heartburn intensity. We obtained MNBI values for 6 impedance segments and performed correlations between the dynamics of heartburn and MNBI values. 6 patients had positive impedance study (AET>6%). Mean MNBI values were 2727±275Ω, 2841±289Ω, 2148±227Ω, 2244±266Ω, 2363±326Ω and 2274±316Ω. We observed significant correlation between ratio value and MNBI value in the most distal (Z6) impedance segment (R=0.7,p=0.01). No correlation was found in Z1-Z5. Correlations between maximal VAS values and MNBI revealed no statistical significance (data not shown).

**Conclusion:** Impaired mucosal integrity directly contributes to heartburn perception in patients with chronic heartburn. This relationship seems valid regardless of the degree of acid exposure. Rather the dynamics of heartburn development than the heartburn intensity is determined by the mucosal integrity.

**Keywords:** GERD, heartburn, acid, nocturnal baseline impedance, TRPV1

## Abdominal pain in youths: prevalence, phenotypes, and associations

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Recent epidemiological studies indicate a high prevalence of gastrointestinal symptoms in youths. The important challenge is to detect the real incidence rate in various geographical and social zones, including associative interactions with the possible risk factors.

**Aim:** to study prevalence of abdominal pain associated with eating habits in young people.

**Methods:** To assess the prevalence of abdominal pain a survey was conducted using the online GSRS, WHO CINDI questionnaire filled in by medical students who gave informed consent to participate into the study. The sample size was 53% (3634 students). Among them 709 (19.51%) were males and 2925 (80.49%) were females. 2379 (65.47%) studied at university and 1255 (34.53%) in college.

**Results:** The presence of abdominal pain syndrome was detected in 2300 (63.29%) students, 1243 of them (54.0%) evaluated their symptoms as mild, 996 (43.3%) and 61 (2.7%) as moderate and severe, respectively. The presence of abdominal pain demonstrated a positive association with the females ($2I = 33.96$, $p < 0.001$), being a medical university student ($2I = 24.45$, $p < 0.001$), increased consumption of coffee ($U = 1544300.5$, $p = 0.0048$), spicy food ($2I = 7.76$, $p < 0.001$), oversalt the cooked food ($2I = 18.85$, $p < 0.001$), low consumption of fruit and vegetables ($U = 1323404.0$, $p = 0.000$). Consumption of 4 or more cups of coffee per day, preferably instant coffee, was typical for the phenotype of people with severe abdominal pain ($2I = 11.36$, $p < 0.001$), low consumption of fresh vegetables and fruit, an average about 270 g per day ($2I = 1234.4$, $p < 0.001$), and often a complete rejection of milk and dairy products ($2I = 16.55$, $p < 0.05$).

**Conclusion:** The revealed features associated with a high frequency of abdominal pain in youths require the development of correction measures to improve the quality of life amid students.

**Keywords:** abdominal pain, gastrointestinal symptoms, eating habits, young people

## Larger amount of fat and higher energy values of rations are typical for children with gastroesophageal reflux disease compared to the control group of the same age and sex

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**Aim** of the present study was to assess nutrients consumption in children and adolescents with gastroesophageal reflux disease compared to age- and weight-matched control group.

**Methods**: Based on symptom evaluation and oesophageal pH-impedance recordings patients were allocated on to GERD and control groups. All patients underwent esophagogastroscopy. Levels of nutrients consumption were assessed with the use of food frequency questionnaire in the regard to the presence of the disease, oesophagitis, and z score body mass index (BMI).

**Results:** Data of 219 children and adolescents were available for the final analysis. Risks to have GERD were higher in groups with obesity (risk ratio (RR) 1.2 [95% confidence interval 0.8-1.7]) and excessive weight (1.1 [0.9-1.4]). Energy values of the rations and amount of fat consumption were higher in the GERD group compared to the control when rations were compared according to z score BMI. In contrast to non-erosive form of GERD, patients with erosive oesophagitis consumed more protein (percentage deviation from the recommended daily allowance Me [25%;75%]): 14.3 (11.07; 19.1) % versus 8.5 (6.71; 14.1) %, total fat 36.8 (12.5; 75.5) % vs 16.9 (10.1; 17.9) %, and less polyunsaturated fats 54.3 (73.4; 47.7) % vs 45.6 (56.2; 33.1) %, $P< 0.05$.

**Conclusion:** The rations of children with GERD are characterized by higher calorie values and larger amounts of fat intake compared to the control group in the regard to z score BMI. Low dietary fibre consumption is additional factor associated with GERD in children with excessive weight and obesity. Compared to non-erosive GERD, higher intake of energy, protein, and total fat and lower of polyunsaturated fats revealed in patients with GERD with erosive oesophagitis.

**Keywords:** GERD, children, nutrition, diet, oesophagitis

## Clinical Impact of and Patient Experience with a Digital Therapeutic That Delivers Cognitive Behavioral Therapy to Adults with Irritable Bowel Syndrome in a Proof-of-Concept Study

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**Aim:** This is the first proof-of-concept study evaluating the clinical impact of the first 5 of 10 sessions of Mahana IBS on irritable bowel syndrome (IBS) symptom severity. Mahana IBS is a prescription digital therapeutic that delivers cognitive behavioral therapy (CBT) to adults with IBS through a mobile app.

**Methods:** The primary outcome was the percentage of participants with clinically meaningful changes (≥50-point improvement) in the IBS Symptom Severity Score (IBS-SSS) at 6 weeks. The usability of the first half of Mahana IBS was assessed using the mHealth App Usability Questionnaire (MAUQ). Eligibility criteria included a self-reported diagnosis of IBS, IBS-SSS ≥75 at screening, and age ≥18 years. Participants were recruited through StudyKIK.

**Results:** Twenty-three participants started the CBT program (ie, starters), and 7 never started the program (ie, nonstarters). Among all participants, the mean IBS-SSS was 287.1 at baseline, indicative of moderate IBS symptom severity. In the study population, 27.5% reported IBS-constipation, 30.0% reported IBS-diarrhea, and 42.5% reported IBS-mixed. Among program starters, 43.5% completed the 5 sessions, and 73.9% completed ≥3 sessions at 6 weeks. The percentage of program starters who achieved the primary outcome, or clinically meaningful improvements in IBS symptoms (IBS-SSS ≥50) at 6 weeks, was 60.9%. Program nonstarters did not achieve improvements. At 6 weeks, the mean changes from baseline in IBS-SSS were -84.3 ($P$<0.001) in program starters and +60.0 in program nonstarters. In program starters, the mean total MAUQ score was 113.7 (scale=18-126), suggestive of high usability.

**Conclusion:** Taken together, these results demonstrate that participants who started the mobile app–delivered CBT program achieved clinically meaningful improvements in IBS symptom severity and found the program highly usable, supporting the feasibility of conducting a clinical trial or real-world study with the full Mahana IBS program.

**Keywords:** CBT, IBS, Digital Therapeutics, Digital, Therapeutics

## The impact of COVID-19 pandemic in the management of achalasia in Eastern region of Morocco

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**Aims:** Achalasia is a primary motor disorder of the esophagus characterized by absence of peristalsis and insufficient lower esophageal sphincter relaxation. It is a rare disease with low incidence. We report retrospectively our experience with achalasia from 2014 to October 2021.

**Methods:** This study aim to describe characteristics of our patients, compare the rate of patients hospitalized for achalasia before and after COVID-19 pandemic, evaluate efficacy of endoscopic treatment of achalasia in our department. These data were analyzed by SPSS21 software.

**Result:** 30 patients were included in our study. Median age of patients at the time of diagnosis was 52.5± 15.8 years with a female predominance (sex ratio 0.4). Dysphagia was the main symptom. The mean Eckardt score was 5.64 ± 1.52. All patients had a dilated esophagus on gastroscopy, esophageal stasis was present in 82.10% and puckered gastroesophageal junction in 78.5%.HRM was performed in 28 patients (93.4%). Most of them had type II achalasia, five patients had type I, and only one patient had type III achalasia. Pneumatic dilatation (PD)was performed as first-line procedure in 25 patients (89.2%). Clinical remission after single dilation was achieved in 15 patients (53,5%). Second session was indicated for the other 10 patients. Three patients benefited from third endoscopic dilatation (37.5%) and only one elderly patient with type III achalasia required fourth session without any clinical improvement, reason why endoscopic injection of botulinum toxin was performed without complete remission. The rate of serious complications of endoscopic dilatation in our study was 0%. Additionally, one patient had successful POEM treatment and three patients had Heller myotomy with partial response. During COVID-19 pandemic, we note a decrease of 1,5% in hospital admission for achalasia, five patients benefited from DP; two of them had an incomplete remission and three patients are waiting for their first dilatation session because thousands of endoscopy procedures were cancelled through the lockdown.

**Conclusion:** Achalasia is rare disease, which impairs the patient's quality of life. In this study, we notice significant reduction in admission of patient with achalasia along COVID-19 pandemic.

**Keywords:** Achalasia, functional disorder, Pneumatic dilatation, COVID-19

## Clinical case: Protective effect of a new mucoprotectant on changes in intestinal permeability and clinical course in patients with post-infectious diarrhea

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Gastrointestinal infections are associated with prolonged diarrhea in some people. Three patients (2 F; 24-34 years) consulted for prolonged diarrhea not responding to diet restriction. The diarrhea began 4-6 weeks before and was related to a process of low-grade fever for 2 days, nausea, vomiting, 5-6 daily bowel movements (Bristol 6-7), abdominal pain, some urgency, but no alarm signs. Patients were initially treated by the general practitioner with diet restriction, rehydration, painkillers and spasmolytics as needed, showing only a partial response, what gave them a lot of discomfort, insecurity to go out and anxiety. Given the prolonged course of the diarrhea a specialist consultation was done.

Physical examination revealed mild abdominal distention, discomfort on palpation and increased intestinal gas and borborigmi. Blood and stool analysis were negative for infectious and inflammatory parameters. A study of small intestinal permeability was requested using the lactulose/mannitol test and urine collection for 2 hours (normality ratio is 0.0209-0.0009).

**Results, Treatment and Discussion:** Basal permeability was markedly enhanced in all three patients (0.0960±0.001). Mucoprotectants have proven its effectiveness for the treatment of acute infectious diarrhea and functional diarrhea. Therefore, treatment with a mucoprotectant combining xyloglucan, reticulated proteins and xylo-oligosaccharides (Gelsectan®) was prescribed in all three: 2 capsules/12h the first week with progressive reduction for 3 weeks. Patients experienced a reduction in abdominal pain, gas disturbance and bowel movements from the first week, with increased consistency and improvement in bloating. All patients had completely normalized bowel habit and urgency by the third week, with disappearance flatulence and no relevant adverse effects. Intestinal permeability at the end of the third week had also normalized.

Mucoprotectants should be considered a safe and easy-available alternative for the treatment of prolonged post-infectious diarrea, particularly if associated with enhanced intestinal epitelial permeability, though confirmation of their effectiveness requires further controlled studies.

## Individual IBS-SSS Item Analyses in Patients with Irritable Bowel Syndrome Given Web-Delivered Cognitive Behavioral Therapy Compared with Treatment as Usual in a Multicenter Randomized Trial (ACTIB)

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**Aims:** The ACTIB trial is the first large randomized controlled trial in primary and secondary care with long-term follow-up to compare web-based cognitive behavioral therapy (WCBT) and telephone-delivered CBT for irritable bowel syndrome (IBS) with treatment as usual (TAU). Previously, statistically significant improvements in IBS Symptom Severity Score (IBS-SSS) were demonstrated at Months 3, 6, and 12 in the WCBT + TAU arm compared with the TAU arm. This post hoc secondary analysis reports results of individual IBS-SSS item scores.

**Methods:** Individual IBS-SSS items were evaluated in the intention-to-treat population at baseline and Months 3, 6, and 12. The changes from baseline for each IBS-SSS item were calculated for each time point. Estimated differences were calculated by subtracting the changes from baseline in the TAU arm from the WCBT arm and were assessed using a mixed-model, repeated-measures analysis on all available data, with treatment, visit, and treatment-by-visit as fixed effects.

**Results:** Baseline values for 5 individual IBS-SSS items were similar between WCBT and TAU groups. The estimated differences for Months 3, 6, and 12 were the following: (1) abdominal pain scores were -9.9 ($P$=0.001), -4.4 ($P$=0.203), and -4.6 ($P$=0.182), respectively; (2) abdominal pain days scores were -1.1 ($P$=0.0004), -0.9 ($P$=0.022), and -0.4 ($P$=0.319), respectively; (3) abdominal distension scores were -13.2 ($P$=0.0001), -7.2 ($P$=0.044), and -8.8 ($P$=0.128), respectively; (4) bowel satisfaction scores were -15.2 ($P$=0.0005), -13.5 ($P$=0.002), and -16.5 ($P$<0.0001), respectively; and (5) IBS interference scores were -18.2 ($P$<0.0001), -11.7 ($P$=0.0004), and -14.5 ($P$<0.0001), respectively.

**Conclusion:** Patients in the WCBT arm showed significant improvements in all individual IBS-SSS item scores at Month 3 compared with those in the TAU arm, supporting the efficacy of WCBT in treatment of IBS symptoms. Significant improvements in bowel satisfaction and IBS interference components continued at Month 12, indicating longer-term overall benefit for WCBT.

**Keywords:** CBT, IBS, Digital Therapeutics, Digital, Therapeutics

## The interim analysis of a prospective, observational, multi-centre, post-marketing surveillance to measure the effectiveness of combination of Omeprazole with Domperidone on patient reported outcome measures in gastro-esophageal reflux disease (GERD)

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**Aims:** The study assesses impact of treatment on improvement of GERD related frequency & severity of symptoms, quality of life, and overall satisfaction of treatment as reported by patients through a validated questionnaire.

**Methods:** Patients requested to provide their assessment of symptoms at baseline, day 14, and at day 28 post initiation of treatment with combination of Omeprazole (20mg) and Domperidone (30mg SR). Symptom improvement score used was Patient Assessment of Gastrointestinal Disorder Symptom Severity Index (PAGI-SYM). Impact on quality of life of patient was done using Patient Assessment of Upper Gastrointestinal Disorder-Quality of Life (PAGI-QOL). Patient's overall treatment satisfaction was assessed using the Treatment Satisfaction Questionnaire of Medication (TSQM).

**Results:** Total 103 patient's data was analysed for interim analysis. The total PAGI-SYM scores at baseline were mean (SD) 29.10 (11.22), which reduced to 17.75 (8.46) on day 14 ($p<0.0001$) & score reduced to 7.10 (7.17) by day 28 ($p<0.0001$). PAGI-QoL scores at baseline were 32.40 (16.90), which reduced to 21.06 (13.68) on day 14 ($p<0.0001$) & reduced to 12.30 (12.62) on day 28 ($p<0.0001$). The scores for TSQM were higher on day 28 than day 14 for all domains of effectiveness, convenience, and global satisfaction. No serious adverse events were reported

**Conclusion:** Significant improvements were seen in symptom scores on PAGI-SYM scale with Omeprazole-Domperidone therapy in patients with GERD. The treatment satisfaction (TSQM) & quality of life (PAGI-QoL) was also significantly improved with Omeprazole–Domperidone therapy.

**Keywords:** Gastro-esophageal reflux disease, Omeprazole, Domperidone, Patient reported outcome

## GASTRIC ONCOLOGY

### Phenotypic characteristics of gastric cancer associated with Epstein Barr Virus

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**Introduction:** Epstein Barr virus (EBV) can cause infectious mononucleosis during the course of initial infection and progress to asymptomatic chronic carriage in more than 90% of cases. It also has oncogenic effect. Recent studies have suggested that EBV-positive (+) gastric cancers have specific characteristics distinct from EBV negative (-) cancers. The aim of our study was to determine the prevalence of EBV+ gastric cancers and to describe the phenotypic characteristics.

**Methods:** We studied 14 cases of gastric cancers treated by surgical resection from 2008 to 2019. In situ hybridization study for the detection of Epstein-Barr encoding region (EBER) had been made in all cases. The presence of EBV DNA was verified by *Polymerase Chain Reaction* (PCR) in EBER+ cases.

**Results:** The average age of our patients was 65 years (range 36 to 91) with a sex ratio M/F of 5.6. Seven cases of gastric cancers associated with EBV have been detected with a prevalence of 50%. Among EBV+ tumors, 3 were located in the antrum, 2 in the cardia and 2 in the fundus. Histological study showed, according to the World Health Organization classification, that EBV+ tumors presented loosely cohesive carcinoma type (n=4) and mixed carcinoma (n=3). According to Lauren's classification, the EBV+ tumors corresponded to diffuse carcinoma in 4 cases and to intestinal type carcinoma in 3 cases. Perineural growth was present in 57% of cases and vascular invasion in 86% of cases. EBV+ tumors was classified pT1 in 14% of cases, pT3 in 43% of cases and pT4 in 43% of cases. There was no significant difference between EBV+ and EBV- tumors regarding clinical, morphological and histological findings.

**Conclusion:** Prevalence of EBV associated with gastric cancer in our study was very high. A larger sample should be studied in order to better characterize the particularities of this association.

**Keywords:** Gastric cancer, EBV

## The association of smoking and alcohol in colorectal cancer in black patients – a case-control study

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**Background:** Several studies have focused on smoking and alcohol as risk factors for colorectal cancer (CRC). Caucasians and other population groups have been studied both locally and internationally, and both smoking and alcohol exposure have been identified and further validated as causes of CRC in larger trials. However, there are limited data on the black population, and the studies that were performed in Africa have not specifically focused on these two risk factors but rather in combination with other risks, such as obesity.

**Aim:** To determine how smoking and alcohol affect the incidence of CRC in the African black population.

**Methods:** The subjects used for the study included black African patients over the age of 18 that had undergone a colonoscopy for suspected CRC between 2016 and 2018 at the Steve Biko Academic Hospital's gastrointestinal clinic. Furthermore, the cases used in this study were confirmed CRC based on histology, and controls were negative based on histology. Data was collected between June 2019 and March 2020.

**Results:** Smoking (odds ratio (OR) = 1.795, $P = 0.049$) was a significant risk factor for CRC amongst black patients who presented at the gastrointestinal clinic. In addition, age > 50 years (OR = 3.742, $P < 0.001$), family history (OR = 12.457, $P < 0.001$), as well as the combination of smoking and consuming alcohol (OR = 5.927, $P = 0.008$) were significant risk factors. Interestingly, alcohol alone was protective (OR = 0.205, $P < 0.001$).

**Conclusion:** This limited study suggests that both smoking and a combination of alcohol and smoking are significant risk factors in the development of CRC in the black population. However because of its limitations, larger studies with quantification of alcohol intake are needed to confirm this suggestion.

**Keywords:** Large bowel, Neoplasm, Tobacco, Alcohol, African

## Knowledge about Gastrointestinal Cancers in People Referred for Endoscopy and Colonoscopy during a Screening Program

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**Purpose:** The most northern and northwestern regions of Iran are at high risk for gastrointestinal cancers**.** In this study, we evaluated knowledge of gastrointestinal (GI) cancers in people referred for endoscopy and colonoscopy screening.

**Methods:** This cross-sectional study was carried out among 461 people who were under the patronage of a local relief foundation and referred for endoscopy and colonoscopy to the Gastrointestinal and Liver Disease Research Center (GLDRC), Rasht, north of Iran, March 2016 to March 2017. A well-defined two sectioned questionnaire was carried out for each group.

**Results:** Overall, 300 and 161 individuals were in the gastric and colon cancer knowledge group, respectively. The level of knowledge in various areas of gastric and colon cancer was desirable. In general, the average of different domains in gastric and colon cancer knowledge questions was 20.2 ± 6.6 and 19.2 ± 4.9, with a knowledge level higher than the mean in gastric cancer (58%) and colon cancer (67.1%). The mean score of knowledge of GI cancers in terms of risk factor indicated a significant relationship between BMI and alcohol consumption. Meanwhile, a meaningful relationship between symptoms and BMI with knowledge was declared. About domains of colon cancer, there was a significant relationship between younger age and knowledge in the risk factor.

**Conclusions:** The results of this study can provide an opportunity to formulate strategies to achieve goals, especially in the field of education, prevention, and control of the disease by raising knowledge for the general public and educating people who are responsible for providing and delivering health services to this community.

**Keywords:** Knowledge, Gastrointestinal, Screening Cancer, Iran, Guilan

## The presence of outer inflammatory protein (OipA) of *Helicobacter pylori* in predicting Gastritis: A gender-based study

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**Aim**: To study the role of interplay of outer membrane protein (OMP) coding genes along with other virulence factors of *Helicobacter pylori* which are responsible for expression of pathogenic factors in the host. *H. pylori* bacteria that colonizes human stomach is the causative agent for gastric cancer worldwide. The outer membrane protein coding genes (OMP), a group of 33 genes encoded by approximately 4% of the genes of *H. pylori*, plays a pivotal role in persistence and colonization of bacteria. The Outer inflammatory protein A (OipA), member of Hop family of OMP can act as a potential biomarker for progression of gastric cancer.

**Method**: Culture DNA of 32 *H. pylori* positive strains were isolated from collected samples from patients suffering with gastrointestinal diseases. DNA was assayed for *OipA* by polymerase chain reaction (PCR). *cagA vacA* status was also evaluated by PCR

**Results**: Our results show that gastritis is found in 17/32 male and 8/32 females. In males 11 are *OipA+ve* with *VacA* gene status as 6/11 *VacAs1m1*, 2/11 *VacAs1m2*, 3/11 *VacAs2m2*, and 6 males are *OipA-ve* with 2/6 *VacAs1m1*, 4/6 *VacAs2m2*. Similarly, in females 3 are *OipA+ve* with *VacA* gene status as 1/3 *VacAs1m1*, 1/3 *VacAs1m2*, 1/3 *VacAs2m2* and 5 females are *OipA-ve* with 1/5 *VacAs1m1*, 4/5*VacAs2m2*.

**Conclusion:** Results show striking linkage between *OipA* gene and gastritis in male and female. We found that male with genotype *OipA+ve/VacAs1m1*and *OipA-ve/VacAs2m2* are more susceptible to gastritis. Whereas females with genotype *OipA-ve/VacAs2m2* are more susceptible to gastritis.

Therefore, *OipA* can be used as an indicator to discriminate prevalence of gastritis in female and male and subsequent risk to develop gastric cancer.

**Keywords:** Gastric Cancer, Outer inflammatory protein A (OipA), *Helicobacter pylori*, gastritis

## HEPATOBILIARY

### Outcome of liver transplantation for metastatic neuroendocrine tumours

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**Background:** Neuroendocrine tumour (NETs) are a heterogeneous group of epithelial tumours. NETs originating in gastrointestinal tract are more likely diagnosed at later stages, often with liver metastases. For patients presenting with bilobar metastases and no severe comorbidities, liver transplantation (LT) should be preferred treatment of choice. The previously reported 5-year survival ranges from 36% to 80%. We present the single centre experience with patients undergoing LT for metastatic NETs.

**Methods:** We retrospectively analysed data of patients who underwent LT for unresectable liver metastases of NET in our transplant centre between October 2009 and March 2021.

**Results:** Eighteen adult patients underwent LT for metastatic NET, 11 men and 7 women. The mean age at the time of transplantation was 52 years, the median follow-up was 45.5 months. The grading of NETs was G1 in 5/18 patients, G2 in 9/18 patients and G3 in 4/18 patients. The most common sites of the primary tumours were pancreas (n=8) and ileum (n=8). One-, 3- and 5-year post-transplant survival rates were 88.2%, 76.5% and 76.5%, respectively, and disease-free intervals were as high as 94.1%, 82.4 and 73.2%, respectively. Five of seven patients living more than 5 years have recurrence of the disease and every patient living more than 8 years have metastatic complications.

**Conclusion:** Liver transplantation represents an efficient and safe treatment modality for the patients with NET and unresectable liver metastases. Despite of high rate of tumour recurrence, especially in grade 3 tumours, the overall survival of the LT recipients is satisfactory. Based on our data, we assume that most of the patients will experience the recurrence of the primary disease in their lifetime, nevertheless, the excellent survival rates are comparable with LT for other indications.

**Keywords:** neuroendocrine tumours, liver metastases, liver transplantation

## CytoSorbTM hemoperfusion efficiency in treating patient with cholestasis due to Autoimmune Hepatitis combined with T-LGL lymphoma, complicated by SARSCoV2 infection – case report

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**Background:** High bilirubin levels over a prolonged period of time can lead to permanent organ damage, so any effort should be done to resolve it, weather by treating underlying cause or with auxiliary methods while waiting for liver to regain its excretory function. Rapidly spreading disease of COVID-19 has caused a pandemic worldwide with significant morbidity and mortality, and liver damage is just one of possible presentation. When COVID disease is combined or simultaneous with some other underlying liver disease, treatment of both conditions is additionally complicated.

**Case presentation:** We present a case of a 59-year-old female patient with cholestatic liver injury due to acute autoimmune hepatitis, complicated with COVID-19 infection, treated successfully with the CytoSorb$^{TM}$ filter. Initial workup, including liver biopsy, suggested autoimmune hepatitis. Since she recently used amoxicillin-clavulanic acid we opted for a theory of autoimmune hepatitis combined with, or even triggered by drug toxicity. In spite of corticosteroid treatment bilirubin and bile acid levels continued to rise so we decided to use hemoperfusion with CytoSorb$^{TM}$. In total, 4 procedures of hemoperfusion with CytoSorb$^{TM}$ were done and bilirubin and bile acid levels reduction achieved. On the 45$^{th}$ day of hospitalisation SARSCov2 positive PCR test was obtained. The bilirubin levels and inflammatory markers gone high again. Additional two CytoSorb$^{TM}$ hemoperfusions were done, with bilirubin and inflammatory markers reduction. Finally, the diagnosis of T-LGL lymphoma was established by liver and bone biopsy, while diagnosis of autoimmune hepatitis could not be abandoned. Treatment with cyclosporine was added to the budesonide, which achieved complete normalisation of liver enzymes as well as bilirubin.

**Conclusion:** Patients with cholestatic liver lesion and high bilirubin values could be effectively treated with CytoSorb$^{TM}$ filter. In a setting with an additional SARSCov2 infection, CytoSorb$^{TM}$ therapy could be used to prevent the development of cytokine storm.

**Keywords:** CytoSorbTM hemoperfusion, autoimmune hepatitis, hyperbilirubinemia, T-LGL

## Radionuclide dynamic cholescintigraphy in Rotor syndrome: a pediatric case report

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**Aims:** The description of the diagnostic value of radionuclide dynamic cholescintigraphy (RCD) in Rotor syndrome (RS).

**Methods:** RS is a rare, benign and inherited cause of conjugated hyperbilirubinemia. The identification of RS is essential in order to prevent misdiagnosis, that can lead to unnecessary investigations and treatment.

**Resuts:** A 3-year-old male presented with persistent jaundice since birth. There was no family history of jaundice or liver disease. The physical examination was unremarkable, except for mild icterus of sclerae. Serum total biliburin was elevated with a conjuctated fraction of 93% of total. Other liver function tests and blood chemistries were within normal range. Ultrasound of the abdomen revealed normal liver and gallbladder. Further investigation included serology for viral hepatitis, immunological testing, celiac disease antibodies**, sweat test for cystic fibrosis, antibodies for autoimmune hepatitis**, direct Coombs test for hemolytic anemia, a1-antitrypsin and total bile acids measurement and examination for Wilson disease. The results of all the above tests were normal. Additional investigation revealed increased total urinary porphyrins (>2-fold coproporphyrin I and III). A RDC was performed. Poor accumulation of the administered radiopharmaceutical was noted in the liver, while the radiopharmaceutical remained predominantly in the heart and the vessels. There was no indication for liver biopsy. These findings were consistent with the diagnosis of RS. In order to establish this diagnosis, a molecular genetic analysis (NGS) was performed and no sequence of SLCO1B1 and SLCO1B3 genes involving in RS was detected.

**Conclusion:** This is the case of a child with characteristic phenotypic and RCD features of RS, but with absence of sequences from the two known genes in molecular genetic analysis. Therefore, this case study indicates that the diagnosis of RS should be probably made using only clinical, laboratory and imaging methods, without performing genetic testing, which is an expensive diagnostic tool.

## Risks of liver fibrosis in patients with a comorbid course of non-alcoholic fatty liver disease and gallstone disease

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**Aim:** to identify clinical and laboratory markers associated with the advanced stages of fibrosis in a comorbid course of non-alcoholic fatty liver disease (NAFLD) and gallstone disease (GD).

**Materials and methods:** 183 patients with NAFLD were included into the open comparative study. The elastography was carried out to assess the stage of liver fibrosis. Also serum concentrations of insulin, leptin, its soluble receptor, and adiponectin were determined. The diagnostic value of the parameters were studied in groups of patients with NAFLD and GD (n = 88) in comparison without GD (n = 95). In the group of patients with NAFLD and GD 62 patients had early stages of fibrosis (F 1-2) and 26 patients had progressive stages of fibrosis (F 3-4). 53 patients underwent cholecystectomy (CE).

**Results:** The positive associations of the progressive stages of liver fibrosis and indications on CE and type 2 diabetes ($r_s = 0{,}234$, $p \leq 0{,}05$ and $r_s = 0{,}226$, $p \leq 0{,}05$) were detected. Advanced stages of fibrosis were registered in patients with NASH ($r_s = 0{,}190$, $p \leq 0{,}05$). Patients with GD had higher levels of GGT and LDL ($U = (-2{,}19509)$, $p < 0{,}01$ and $U = (-1{,}91493)$, $p < 0{,}01$). Liver fibrosis in patients with GD was associated with an increase of LDL levels ($r_s = 0{,}306$, $p \leq 0{,}05$). Hyperleptinemia positively correlated with the progressive stage of fibrosis in patients with GD and NAFLD ($r_s = 0{,}363$, $p \leq 0{,}05$). According to the multiple regression analysis CE and type 2 diabetes had the highest significance in relation to liver fibrosis in patients with NAFLD.

**Conclusion:** the progression of liver fibrosis in patients with NAFLD and cholelithiasis is associated with clinical and biochemical activity of the disease (NASH), dyslipidemia, type 2 diabetes and hyperleptinemia; cholecystectomy can be considered as an unfavorable factor in the development of advanced fibrosis in patients with NAFLD.

**Keywords:** non-alcoholic fatty liver disease, gallstone disease, liver fibrosis, cholecystectomy

## DEB-TACE as a way of treating patients with HCC

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The aim of the study was to show the usefulness of transarterial chemoembolization with chemotherapeutically loaded beads (DEB-TACE) in the treatment of patients with hepatocellular carcinoma.

Hepatocellular carcinoma (HCC) is the most common primary malignant tumour of the liver. When patients cannot undertake surgical treatment or are waiting for transplantation, chemoembolization is one of the main methods that may be used. It is a minimally invasive procedure involving embolization of vessels, suppling malignant lesions in the liver with blood, with the usage of chemotherapeutically loaded beads administered transarterially among others. In recent years the number of DEB-TACE has increased, especially in the treatment of HCC.

DEB-TACE is made under local anasthesia through puncture of femoral artery.

The procedure begins with an angiographic examination – administering a contrast agent through a catheter placed in the visceral trunk and superior mesenteric artery in order to locate vessels supplying the lesion in the liver. Using a microcatheter and a microwire, selective catheterization is performed on small arteries supplying the tumor. Next, special doxorubicin-loaded microparticles are administered, through the microcatheter, directly to these small vessels. The blood supply is being cut off by clogging the tumor microvessels, causing infarction and necrosis of the lesion. Additionally, through a slowly-released drug, they inhibit tumor growth.

Chemoembolization is a safe and effective method in the treatment of particular patients with hepatocellular carcinoma. Although it is used mainly as a palliative treatment, it frequently extends the survival time and improves the quality of life. In some cases, the primary unresectable lesion may become a resectable lesion.

**Keywords:** hepatocellular carcinoma, DEB-TACE, chemoembolization

## IBD

### Searching for new predictive markers for vedolizumab therapy response in patients with ulcerative colitis

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**Aims:** Vedolizumab is a first-line treatment of inflammatory bowel disease (IBD). Its high efficacy and safety, as well as its gut-specificity, make this drug an appealing therapy for individuals with moderate to severe IBD. However, as observed for other biologic treatments, a significant proportion of patients do not respond to vedolizumab treatment. Currently, there is no reliable biomarker to predict vedolizumab therapy response, although this would be of significant medical and socioeconomic value. For that reason, the primary goal of this study is to establish the basis for the search of predicting factors for this treatment.

**Methods:** For the realisation of the study, we recruited responder and non-responder patients to vedolizumab treatment. We analysed the frequencies of different immune system populations from blood samples by flow cytometry. Also, the expression of specific genes in PBMCs by RT-qPCR was measured. These experimental procedures were performed at baseline (T0) and 14-week follow-up (T14).

**Results:** Our results show a specific pattern in responder and non-responder patients in the percentages of different immune cell populations at T0 vs T14. Similarly, we observed a significant reduction in chemokine and pro-resolutive factors expression at T0 vs T14 in PBMCs from vedolizumab responder patients, which was not observed in non-responder patients.

**Conclusion:** Our data suggest that the frequencies of certain immune populations or the modulation of the expression of specific genes in PBMCs could function as specific biomarkers for response to vedolizumab therapy.

**Keywords:** biomarkers, vedolizumab, inflammatory bowel disease, ulcerative colitis

## Patients with Crohn's Disease had an increased neuroendocrine tumor development

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**Introduction:** The incidence of colorectal cancer is increased in patients with inflammatory bowel diseases (IBD) and mainly due to the long duration of IBD. However, neuroendocrine tumor (NET) risk was not fully evaluated in IBD, particularly Crohn's disease (CD). We aimed to determine whether there is an increased risk for the development of NET in CD. We also questioned whether the incidence of any cancer in patients with IBD is increased.

**Materials and Methods:** We studied on patients with ileocecal resection at the Surgical Clinic of Bezmialem Vakif University Medicine Faculty Hospital between 2011-7. Of the 246 patients performed ileocecal resection for any reason (15 to 98 and average 59 years) with pathology results, 56 were due to CD with non-malignant reasons such as fistula and or stricture and abscess.

**Results:** Of the 246 patients, 16 with NET, 6 with Carcinoid Tumour, 164 had adenocancer and 60 were non-malignant reason. In subgroup analysis, of the 56 patients with CD, 2 had NET, 4 had Carcinoid Tumour, 4 showed adenocancer. Of the 190 non-IBD patients, 14 had adenocancer with NET differentiation, 2 had Carcinoid Tumour, 160 with adenocancer and 14 with non-malignant reason.

**Conclusion:** Our study showed that patients with CD had an increased NET development risk, besides increased colon adenocancer frequency.

**Keywords:** Crohn's disease, adenocancer, colon cancer, neuroendocrine tumors

## Anxiety-depression in inflammatory bowel disease: prevalence and associated factors

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**Aims:** The negative impact of chronic inflammatory bowel disease on patients' quality of life is now well known.

**The objective** of our work was to determine the prevalence of depression and anxiety in IBD patients and to study the factors associated with the occurrence of these disorders.

**Methods:** This is a prospective cross-sectional study conducted over a period of three months, which included patients with chronic inflammatory bowel disease. We used the PHQ-9 to assess depression, the GAD-7 for anxiety. The factors associated with the occurrence of anxiety and depression were analyzed by SPSS software.

**Results:** Forty-three patients were enrolled, 25 men (58%) and 18 women (42%), with a mean age of 41 +/- 12 years. Thirty-three patients (77%) had Crohn's disease and ten patients (23%) had Rectocolitis Hemorrhagica. Thirty-three (70%) were in remission while ten (30%) were in relapse.

The mean PHQ-9 score was 7.9 which corresponded to mild depression. Twelve patients (28%) had mild depression and fifteen (32.6%) had moderate to severe depression. The mean GAD-7 score was 9.3 which corresponded to moderate anxiety. Twenty patients (46.5%) had mild anxiety, eleven (25.6%) had moderate anxiety and seven (16.3%) had severe anxiety.

In total, thirty-nine patients had depression (51% with CD). Thirty-eight patients had anxiety (65% with CD), i.e. respective prevalences of 90 and 88% in our series. Twenty-nine patients had depression and anxiety, i.e. 67.4%.

A higher level of education (p=0.02) was associated with the occurrence of depression during IBD. Moreover, we found two factors associated with the occurrence of anxiety during IBD: a young age of onset of the disease (p=0.23) and smoking (p=0.02).

**Conclusion:** Given the high prevalence of depression and anxiety it is essential to be able to detect these disorders early in order to offer patients specialised care.

## Faecal microbial transplantation versus 5-ASA enema for treatment of active left-sided ulcerative colitis – results from randomized control trial factu

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**Introduction:** Ulcerative colitis (UC) is a difficult-to-treat chronic inflammatory disease of the colonic mucosa and submucosa. Faecal microbial transplantation (FMT) is an alternative promising treatment.

**Aims & Methods:** This multicentre, open-label, non-inferiority trial randomised patients with active left-sided UC (Mayo-score 4–10) equally to FMT or 5-aminosalicylic acid (5-ASA) enemas. FMT enemas were administered five times in the first week and then once weekly for 5 weeks. 5-ASA enemas were administered daily for 2 weeks and then every other day. The primary study endpoint was clinical remission, a total Mayo-score ≤ 2 at week 12 with no subscore > 1.

**Results:** Between April 2017, and October 2020, 61 patients were screened for the trial. Of these, 45 individuals were randomly allocated to either FMT (n=23) or 5-ASA (n=22) enema. Forty-three patients completed at least a visit in week 4 and were included in the modified intention-to-treat analysis, 21 in the FMT group and 22 in the 5-ASA group. Twelve (57%) patients assigned to FMT and 8 (36%) allocated to 5-ASA enema reached the primary endpoint. We have proven FMT non-inferiority with 10% non-inferiority margin: 95% CI (-7.6; 48.9) %. Adverse events were reported by 12 (57%) patients assigned FMT compared to 13 (59%) patients allocated to 5-ASA enema. Microbial diversity increased after FMT and the effect was sustained for at least 3 months after FMT.

**Conclusion:** The results of this trial confirm that FMT enema is a promising treatment for left-sided UC and is associated with increased diversity of recipients' microbiome. Moreover, targeted microbiome modification may contribute to even greater FMT efficiency and it could offer a new treatment option for difficult-to-treat UC. However, further research is needed for accurate and suitable selection of patients and donors for this therapy.

**Keywords:** FMT, ulcerative colitis, feacel microbial transplant

## Plectin Ensures Intestinal Epithelial Integrity and Protects Colon Against Colitis and Colorectal Cancer

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**Background and aims:** Plectin, a highly versatile cytolinker protein, provides tissues with mechanical stability through the integration of intermediate filaments (IFs) with cell junctions. Here, we hypothesize that plectin-controlled cytoarchitecture is a critical determinant of the intestinal barrier function and homeostasis.

**Methods:** We analyzed plectin expression in colons from patients with ulcerative colitis (UC) and control individuals. We generated new mouse models inducing intestinal epithelial cell (IEC)-specific ablation of plectin either during development ($Ple^{\Delta IEC}$) or in adults ($Ple^{DIEC\text{-}ERT2}$).

**Results:** Expression of plectin negatively correlated with inflammation in UC patients. Mice lacking plectin spontaneously developed colitis characterized by extensive detachment of IECs from the basement membrane (BM), increased intestinal permeability, and inflammatory lesions. Moreover, the chronic inflammation in $Ple^{\Delta IEC}$ mice evolves into spontaneous development of colorectal cancer. Mechanistically, plectin deficiency in IECs led to aberrant keratin filament (KF) network organization and formation of dysfunctional hemidesmosomes (HDs) and intercellular junctions. In addition, the hemidesmosomal a6b4 integrin (Itg) receptor showed attenuated association with KFs, and protein profiling revealed prominent downregulation of junctional constituents. Consistent with effects of plectin loss in the intestinal epithelium, plectin-deficient IECs exhibited remarkably reduced mechanical stability and limited adhesion capacity *in vitro*. Feeding mice with a low-residue liquid diet that reduced mechanical stress successfully mitigated epithelial damage in the $Ple^{\Delta IEC}$ colon, but not in the small intestine. Antibiotic treatment also decreased epithelial injury and mucosal inflammation. Besides colitis, $Ple^{\Delta IEC}$ mice displayed progressive hepatic injury and enhanced hepatocarcinogenesis, which highlights the importance of the intestinal barrier for prevention of liver pathologies.

**Conclusion:** Our study shows that plectin acts as a safeguard against intestinal inflammation and carcinogenesis by maintaining functional KF/cell junction organization and intestinal epithelial stability.

**Keywords:** hemidesmosome, keratin filaments, intestinal barrier, gut-liver axis, hepatocellular carcinoma

## When what you see is not UC – an unusual presentation of pancolitis in a developed country

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**Aims/objectives:** The misdiagnosis of intestinal schistosomiasis is not uncommon given its variety of clinical manifestations which often share similarities with ulcerative colitis (UC). While endoscopy aids in diagnosis, findings are often non-specific and correlation with histopathological features is crucial in arriving at an accurate diagnosis – confirmed by the presence of schistosome ova within the lamina propria. In this case study, we report our experience with a 50-year-old Filipino patient, who had been residing in Singapore for more than a decade, presenting with recurrent episodes of bloody diarrhoea.

**Methods/Results:** This case report details how this patient was initially diagnosed with an acute flare of UC following endoscopic findings of pancolitis, friable mucosa with ulcerations and contact bleeding. She was given intravenous hydrocortisone and Mesalazine in both oral and rectal forms with almost immediate improvement, and was thereafter discharged with a tapering dose of Prednisolone. However, the final histology report revealed acute on chronic colitis with calcified schistosoma eggs in the descending colon and on rectal biopsies. The above medications were stopped and she was treated with a course of Praziquantel with complete resolution of symptoms, remaining well at subsequent follow-up.

**Conclusion:** This case highlights the challenge in the accurate diagnosis of intestinal schistosomiasis, and the need to consider this diagnosis in a patient with suspected UC, especially in the presence of a history of prior residence in endemic areas or contact with infected freshwater. Having an index of suspicion would then guide clinical acumen for endoscopic evaluation, ensuring adequate biopsy samples in the search for the histopathological presence of schistosome ova—which would then clinch the diagnosis and enable administration of appropriate treatment.

**Keywords:** Schistosomiasis, Ulcerative colitis, Colonoscopy, Inflammatory bowel disease

## Impact of Rutgeerts score on the management of operated Crohn's disease

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**The aim** of our study is to evaluate the efficacy of the strategy undertaken based on postoperative colonoscopy, and then to identify predictive factors of postoperative recurrence.

**Methods:** This is a prospective analytic study conducted at our department, including 122 patients with operated Crohn's disease out of a total of 651 patients with CD between January 2010 and January 2021. The Rutgeerts score was assessed in all these patients. Multiple linear logistic regression was performed, with a retained significance level of 0.05.

**Results:** Mean age of patients was 43.2 ±6.4 years with a sex ratio (M/W)=0.7.

The main indication for surgery was stenosis in 70 of our patients (69%). 56 of patients were put immediately after surgery on 5 ASA (55%), 30 on thiopurines (29%), 16(16%) remain under no treatment. 14 (86%) patients had endoscopic recurrence with a score of Rutgeerts i2 in 58 patients (57%), Rutgeerts i3 in 3 patients (3%) and Rutgeerts i4 in 11 patients (11%). After medical adaptation according to these scores, 36 (36%) progressed to clinical recurrence after a median of 30 months [7-59], and 11(9%) progressed to surgical recurrence after a median of 48 months [23-73].

In multivariate analysis and adjusting on confounding parameters, preventive treatment with 5 ASA and smoking were associated to endoscopic recurrence with (OR= 3.1, CI [1.15-4.2], p= 0.002) and (OR=1.17, CI [1.13-2.19], p= 0.003) respectively.

**Conclusion:** A therapeutic strategy based on the evaluation of postoperative endoscopic recurrence within one year after surgery allowed in most of our patients to control the disease by adapting the treatment according to the Rutgeerts score.

## Primary immunodeficiency and inflammatory bowel disease: gut microbiome and mucosal protein profile

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**Aims:** The aim of the research is a comprehensive study of the structure of colon microbiota in patients with primary immunodeficiency (PID), common variable immunodeficiency (CVID) and ulcerative colitis (UC) in different phases of the disease course.

**Methods:** The research included 19 patients with PID, 28 with CVID and 32 with UC (22 with relapse and 10 with persistent remission of the disease), control group – 20 healthy volunteers. Estimation of gut microbiota was performed by microbacteriological seeding faeces (MS), by the content of short-chain fatty acids (SCFA) in the feces as determined by gas chromatography-mass spectrometry (GC-MS). The mucosal proteomic profiles (MPP) were assessed using isoelectric focusing SDS-PAGE, 2DGE; MALDI-TOF-MS / MS (Bruker, USA).

**Results:** MS showed the conditionally pathogenic microflora was represented by E. coli, lactosenegative and haemolytic strains (n = 5,2 $10^5$/g, n = 3,4 $10^4$/g), candida (n = 5,1 $10^{4\text{-}6}$/g) in stool culture. SCFA showed a 6,9 and 11 fold decrease in propionic and butyric acids, mainly in patients with PID and UC: 0.2±0.1 mg/g, 0.14±0.03 mg/g and 0.04±0.02 mg/g, respectively. Results of MPP of the colon mucosa in patients with PID were detected: 1, 2, 4 okkludin, kininogen 1, interleukin 8, CVID – interleukin-1B, apolipoprotein C-III, UC NF-kB, TNF- α, interleukin-2 and 8 were presented. In patients with UC, production of hydrogen normalized in the stable remission phase, the total bacterial load was reduced by a resident anaerobic microflora, the production of butyric acids increased to subnormal levels.

**Conclusion:** In patients with PID, CVID and UC gut disbiosis and significant decrease in SCFA are recorded during the relapse period. MPP in patients with PID, CVID and UC was characterized by proteins characteristic of inflammation, apoptosis. In the phase of persistent remission have recovery trend of gut microbiota, production of SCFA, disappearance of specific components MPP.

**Keywords:** common variable immunodeficiency, ulcerative colitis, primary immunodeficiency, mucosal proteomic profiles, gut microbiome

## Incidence of inflammatory bowel disease over a 12-year period in Kaunas region, Lithuania

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**Aim:** The aim of this study was to observe the incidence of IBD in Kaunas region, Lithuania over the course of a decade.

**Methods:** Data on all the new cases of ulcerative colitis and Crohn's disease has been collected prospectively since 2007. The diagnosis of IBD was made using the Copenhagen criteria in a single center that receives referrals from the whole region. European Standard population and the National census data were used to obtain the age and gender standardized incidence rates.

**Results:** 455 new cases of IBD were diagnosed during the 12-year period. We observed a steady increase of IBD incidence over the period, from 8,27 (per 100000, age adjusted) in 2007 to 11,6 in 2018. However, while there was only a gradual increase in UC incidence (from 6,85 to 9,3), the incidence of CD increased substantially from 0,95 in 2007 to 2,3 in 2018. Between 2007 and 2009, the majority of new UC cases were diagnosed between the ages of 41–50 years, while between 2014 and 2018, most of the incident UC cases were diagnosed between the ages of 21–30 years.

**Conclusions:** The incidence of IBD in Kaunas region is increasing, but is still concordant with the reported average of Eastern Europe. However, we are observing an almost 3-fold increase in the incidence of CD. Age at disease onset of ulcerative colitis is decreasing and is now comparable to the values reported by Western-European countries.

**Keywords:** Inflammatory bowel disease, Ulcerative colitis, Crohn's disease, Incidence, Epidemiology

## Contribution of pelvic MRI in the diagnosis and management of Ano-perineal Crohn's disease

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**Aims:** The aim of our study is to evaluate the contribution of pelvic MRI in the diagnosis and treatment of ano-perineal lesions (APL) in CD.

**Materials and Methods:** This is a retrospective descriptive study over a period from January 2015 to January 2021, including all patients with CD with APL collected at our department. They all had a proctological examination, sometimes under general anesthesia, and a pelvic MRI.

Treatment of the APL was based on: antibiotics, drainage, Immunosuppressive therapy (IT) and anti TNFα. Patients had pelvic MRI one year after the beginning of treatment. Evaluation based on: number of fistulas and contrast uptake.

**Results:** We included 56 patients with a mean age of 37 years, with a sex ratio(M/F) =0,6.

APL was revealed by proctalgia in 35 cases (62.5%), purulent discharge in 16 cases (28.57%), vulvovaginal discharge in 4 cases (7.14%).

Proctological examination showed 38 fistulas (67.8%), abscess in 8 cases (14.28%), stenosis in 13 cases (23.21%) and ulceration in 17 cases (30.35%).

MRI detected 48 fistulas, of which 18 (31%) were intersphincteric, 13 (25%) transphincteric, 4 (7%) suprasphincteric, and 2 (3%) extrasphincteric. A recto-vaginal fistula in 1 case (2%), 3 ano-vulvar fistulas (6%), 3 ano-vaginal fistulas (6%), one ano-urethral fistula (2%) and 3 ano-perineal fistulas (6%).

24 patients were on IT (43%) and 32 on anti TNF (57%), 25 patients (78%) were on Infliximab and 7 patients (22%) on Adalimumab.

The radiological evolution of APL before and after treatment was as follows:

Under anti-TNF the number of patients there was persistent contrast enhancement decreased to 37.5% compared to 100% before treatment with a p= 0.001 and also the decrease in the number of fistulas in 21 patients (65%).

**Conclusion:** Pelvic MRI allows not only to specify the APL during CD, but also the evaluation of the efficacy of biotherapy treatment.

## Ileal stenosing Crohn's disease: medical or surgical treatment?

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**Aims:** Crohn’s disease (CD) is a chronic inflammatory disease of the intestine. Evolution is marked by flare-ups and appearance of several complications including ileal stenosis.

The aim of this work is to study the epidemiological, clinical, therapeutic and evolutionary characteristics of ileal stenosis.

**Methods:** A descriptive retrospective study conducted from January 2015 to January 2021, involving CD patients with ileal stenosis. We collected endoscopic (upper endoscopy and colonoscopy) and radiological assessment and medical and/or surgical treatment data.

**Results:** We included 96 patients with small bowel stenosis with a prevalence of 27% of all CD. There were 14 men (58.3%) and 10 women (41.7%). There was a male predominance with a sex ratio (M/F) of 1.4. The average age was 37.2 years. Smoking was found as a risk factor in 2 cases (2.1%). Koenig's syndrome and right iliac region pain predominated the clinical picture in 60 cases (62.5%). The stenosis was single in 62 cases (65%) and multiple in 34 cases (35%). These stenoses were demonstrated by entero-scanner and/or entéro-MRI. In case of stenosis of the last ileal loop, ileocolonoscopy reveals a blistered and stenotic Bauhin's valve. Therapeutic management was characterized by frequent use of corticosteroids and immunosuppressants in 63 cases (65.6%). Surgical treatment was indicated immediately in the case of occlusion in 26 cases (27%) and when medical treatment failed in 7 cases (7.2%). Postoperative recurrence was noted in 2 cases.

**Conclusion:** The occurrence of ileal stenosis in CD is a common problem and their treatment differs depending on whether the stenosis is inflammatory or fibrotic. Imaging plays a central role in the diagnosis and treatment strategy. The relatively high risk of recurrence after surgical treatment requires optimal management after the procedure.

**Keywords:** Crohn’s disease, ileal stenosis, Treatment

## Nucleoside diphosphate-linked moiety X motif 15 (NUDT15) polymorphisms causing severe myelosuppression secondary to azathioprine toxicity

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**Introduction:** Thiopurines are very commonly used in practice for treating a variety of inflammatory disorders. Thiopurine-induced myelosuppression (TIM) has a cumulative incidence of 7% and a mortality of 1% as a result of opportunistic infections. The onset is usually a few weeks following initiation. Impaired NUDT15 enzymatic activity is thought to result in accumulation of 6-TGTP and subsequently increased incorporation into DNA, causing apoptosis. It has been suggested that *NUDT15* and *TPMT* mutations may account for approximately 88% of cases of TIM.

Genotyping for *NUDT15* polymorphisms prior to thiopurine therapy is not currently routine clinical practice in the UK whilst it is for *TPMT*. This case raises the importance of performing this in specific ethnic groups.

**Case presentation:** A 35-year-old female of South Asian ethnicity presented with severe alopecia, fatigue, and gingival bleeding four weeks after commencing azathioprine therapy for Crohn's disease. She was found to have pancytopenia and was managed as neutropenic sepsis with G-CSF and broad-spectrum intravenous antibiotics. Genotyping was performed which showed that the patient was homozygous for the *NUDT15 p.Arg139Cys* variant, which is associated with severe thiopurine-induced myelosuppression. Her full blood count gradually improved and she was discharged home safely.

**Learning points:**

1. Severe azathioprine toxicity secondary to *NUDT15* polymorphisms can be life threatening due to severe myelosuppression and risk of neutropenic sepsis.
2. Clinicians should be routinely screening for polymorphisms in relevant at risk ethnic groups, such as *NUDT15* in those of Asian or Hispanic ethnicity.
3. Genotyping could also be utilised to establish personalised dosing regimens, for example in those with *NUDT15* heterozygous variants.
4. Further research is needed to determine the relationship between NUDT15 polymorphisms, thiopurine metabolites and implications for dosing regimens.

**Keywords:** NUDT15, IBD, Thiopurines

## Crohn's disease: Nutritional assessment and factors of imbalance between intakes and needs

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**Introduction:** Protein-energy undernutrition results from an imbalance between the body's protein-energy intake and requirements. It is frequent during chronic inflammatory bowel diseases (IBD) due to malabsorption. The aim of our study was to evaluate the nutritional status (quantitative and qualitative) of patients with Crohn's disease (CD).

**Methods:** This is a prospective analytical study including all patients with CD followed or hospitalized at the gastroenterology department of Habib Thameur Hospital in Tunis. The dietary investigation was based on the patients' dietary history. We used the BILNUT version 2.01 software to analyze the data of our dietary survey. Patients' nutritional needs were determined from the calculation of total energy expenditure by multiplying the Resting Energy Expenditure by the Physical Activity Level. Undernutrition was defined by a BMI < 18.5 kg/m$^2$ and/or albumin level < 35 g/l.

**Results:** Thirty patients were included in our study. The mean age was 43.6 years [19-67]. The mean duration of CD was 10 years [0–33]. Thirteen patients were in relapse, nine of whom were hospitalized. The mean BMI was 22 kg/m$^2$ [15–43] and the mean albumin level was 35 g/L [14-46]. Undernutrition was noted in 10 patients (33%). The dietary survey showed that the average intake was 2100 Kcal [1000-6000] and the average requirement was 2300Kcal [1780–4100]. Seventeen patients had inadequate daily intakes. These insufficiencies concerned mainly protein (54g versus 85g in not undernourished, p=0.03), carbohydrates (216g versus 322g, p=0.02), lipids (55g versus 88g, p=0.04), phosphorus (644mg versus 866mg, p=0.01) and vitamin C (49mg versus 105mg, p=0.02). Only two patients were sufficiently physically active. Inadequate intakes were associated with anorexia (p=0.006), self-restriction (p=0.035), abdominal pain (p=0.02) and diarrhea (p=0.002).

**Conclusion:** Nutritional deficiencies are common in CD. These deficiencies require systematic screening during follow-up, as well as appropriate management with recourse to dietary advice from a nutritionist.

**Keywords:** Crohn's disease, Nutritional evaluation

## IBD patients show different microbiota compositions and specific anti-bacterial response during anti-TNF therapy

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**Aims:** Inflammatory bowel diseases (IBD) are chronic disorders of the gastrointestinal tract which are linked to microbiome dysbiosis as well as to immune system dysregulation. We investigated the longitudinal effect of anti-TNF therapy on gut microbiota diversity and composition, and specific immune response to commensal bacteria in IBD patients.

**Methods:** The study included 52 patients tracked over 38 weeks of therapy and 37 healthy controls (HC). We used amplicon sequencing of the V3V4 region of 16S rRNA to reveal the diversity and community composition of the bacterial microbiome and ITS1 region for fungal microbiome. We measured antibody and IL-17 production by ELISA.

**Results**: We found striking variability in the gut bacteriome diversity between individuals. Almost half (45%) of the observed variance in beta diversity was explained by individual. We report alpha and beta diversity differences between healthy controls, Crohn's disease (CD), and ulcerative colitis (UC) patients. Factors such as disease severity, localization, and surgical intervention were identified to significantly contribute to changes seen in gut bacteriome. We show that bacterial community of IBD patients is more similar to HC at the study endpoint. Specifically, we identified *uncultured Ruminococcus* to be increased at the study endpoint in UC patients. We revealed increased IgM levels against gut commensals after anti-TNF therapy. Moreover, increased total IgM levels correlated with disease severity in CD patients. Additionally, increased IL-17 production by PBMC upon stimulation with Blautia antigens was observed at the week 38 of therapy in UC patients.

**Conclusions**: These results emphasize the importance of gut microbiota diversity and composition as well as specific immune response to gut bacteria in IBD pathogenesis. Anti-TNF therapy influences these factors to a different extent in CD and UC patients.

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## Gluten degradation by the Gut Microbiota of ulcerative colitis patients

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**Aim:** A number of studies have reported improved disease symptomology in ulcerative colitis (UC) patients consuming a gluten free diet. This observation coupled with diminished diversity of the microbiota characteristic of UC led us to hypothesize that enteric microbiota may differentially metabolize dietary gluten to produce immunogenic products that promote intestinal inflammation.

**Methods:** Amount of gluten in fecal samples was determined using gluten-specific ELISA, and gluten intake was assessed by food frequency survey in UC (n=12) and age-matched healthy controls (HC; n=13). Gluten-degrading bacteria was isolated on minimal media supplemented with 1% gluten and spent gluten media was used to assess immunogenicity in HT29 colonocytes.

**Results:** Compared to HC, UC patients exhibited equivalent levels of gluten in stool (Mann-Whitney; *p=0.163*) whilst consuming similar intake of gluten (Mann-Whitney; *p > 0.10*). The assortment of gluten-degrading bacteria isolated from UC stool was distinct (Chi-square; *p = <0.0001)* and was primarily dominated by *Enterococcus* species. Compared to same genera isolated from HC subjects, *Bacillus* and *Enterococcus* isolated from UC trended to induced a higher expression of IL8 and occluding genes in colonocytes.

**Conclusion:** Members of UC microbiota exhibit gluten-degrading ability, product of which induce distinct pro-inflammatory response in colonocytes compared to similar genera isolated from stool of HC subjects. Preliminary findings of this study warrant further investigations into the mechanisms by which gut microbiota contribute to UC pathogenesis through gluten degradation.

**Keywords:** Ulcerative colitis, Gluten sensitivity, gluten-degrading microbiota

## Fragility Fracture Risk Assessment in Inflammatory Bowel Disease Outpatients Clinic Re-Audit

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**Introduction:** Inflammatory Bowel Disease has a known association with osteoporosis. The prevalence of osteoporosis with a background of IBD ranges 2-30% (Sapone, Minerva Med, 2008, 99:p65-71). The Fragility Risk Assessment Tool (FRAX) is a useful tool to identify patients at risk of fragility fractures. In the Diana Princess of Wales Hospital IBD outpatient clinic in February 2018 FRAX tool use was assessed finding 62.5% would benefit from a FRAX assessment, of the cohort 40.6% would benefit from bone mineral density scanning.

**Aims:** To review fragility fracture risk assessments use in IBD clinic in Feb 2018 compared to Feb 2021. To bring more awareness of IBD patients risk of fragility fracture and potential need for Bone Protection Therapy (BPT). To apply FRAX tool if not completed and assess outcomes.

**Method:** Retrospectively we assessed in an outpatient IBD clinic (15/2/21 to 26/2/21) n=39. Information obtained via hospital intranet system and case notes. Compared effectiveness of teaching sessions, and stickers provided from previous audit.

**Results:** An improvement of 4 FRAX assessments done compared to 0 in 2018. 7 patients were recommended to have a DEXA scan; of which 2 had DEXA scans, 1 referred to rheumatology. An improvement from 2018 was there was enough information available to complete the FRAX score for all patients that would be advised to have a FRAX. 2 patients were identified to require BPT and had treatment.

**Conclusion:** In the previous audit, a sticker which was adapted twice was trialled, however uptake was poor. Verbal communication and computer demonstration on how to access use FRAX was fed back as more helpful. We propose implementing a simple functional heuristic accessible on phone or as a poster to improve uptake of FRAX.

**Keywords:** Inflammatory Bowel Disease, Fragility Fracture, FRAX

## Sleep Disturbances and Quality of Life in Patients with Inflammatory Bowel Disease on Biological Therapy in Montenegro

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**Introduction:** Inflammatory bowel disease (IBD) is a group of chronic disorders which are associated with sleep disturbances that might have an additional negative impact on patient's quality of life.

**Materials and methods:** The study was performed at the Clinical Center of Montenegro. We investigated 90 patients with IBD who were receiving intravenous biological therapy (IBT). Patients completed the questionnaire about frequency of sleeping problems for the last two weeks (no problem at all / had a problem for several days / more than half of the days / almost daily) and short questionnaire about quality of life (sIBDQoL).

**Results:** The study group included 48 patients with ulcerative colitis (UC) and 42 patients with Crohn's disease (CD); 53 of them were receiving anti-tumor necrosis factor (TNF) therapy, while 37 patients were on anti-integrin therapy. 23 patients (25.6%) had an active form of the disease. Overall, percentage of patients without sleep disturbances in the last two weeks was 57.8%. 21 patients (23.3%) reported sleep disturbances for several days, 8 patients (8.9%) for more than half of the days, and 9 patients (10%) almost daily for the past two weeks. The active form of IBD statistically correlated with sleeping disturbances ($p = 0.036$). All domains (Bowel $r = -0.350$, Systemic $r = -0.600$, Emotional $r = -0.640$ and Social $r = -0.396$) and total score for sIBDQoL ($r = -0.642$) were inversely correlated with sleep-related problems (high statistical significance).

**Conclusion:** In our study it was found that sleep disturbances were more common in active IBD and they also negatively affected the quality of life of patients on IBT.

**Keywords:** IBD, Biological therapy, Sleep disturbances, Quality of life

## The effectiveness of molecular markers in the diagnosis of ulcerative colitis

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**Aims:** The mechanisms of ulcerative colitis (UC) progression require detailed study. Modern achievements of proteomic methods of analysis are ideal for research us to define molecular characteristics of inflammation in colon mucosa (CM) of UC patients.

**Methods:** The study was comparative cohort with parallel design and included 88 patients (range from 22 to 35 years, 37 men and 51 women): 53 (60.2%) pancolitis and 35 (39.8%) left-sided UC, mild and moderate activity. The control group included 30 healthy individuals. Biosamples of CM in patients with UC in the active stage and in healthy persons were received by ileocolonoscopy with CM biopsy. The separation of individual proteins of CM was based on technologies of IEF, SDS-PAGE, 2DPAGE, by standard sets (MB-HIC C8 Kit, MB-IMAC Cu, MB-Wax Kit, «Bruker», USA). Automated mass spectrometry imaging was performed by MALDI-TOF-MS/MS, Ultraflex II, «Bruker», USA).

**Results:** We identified functional groups of peptides and proteins in molecular patterns of CM: SMAD family member 2 (SMAD2) activates the transcription of TFG1β, that leads the development of fibrosis in colon submucosa in UC patients; the stimulation of the expression of apoC-III in affected CM in UC is associated with the activation of the FOXO1 signaling pathway that supports inflammatory processes ; caspase 8 protects colonocytes from TNFα-induced cell death through a necroptosis mechanism via the blockade of the RIP3 expression; significant decrease of the PPARγ expression promotes the activation of STAT and AP-1 signaling pathways, which promotes the activity of immune and inflammation processes in CM and a significant increase in the NF-kB expression in CM is associated with the activation of TNFα and IL-1, which promotes the increase of immune processes in CM.

**Conclusion:** Bioinformatics analysis revealed the presence of the molecular interactions involved UC, thats may provide for the development of novel diagnostic tests for UC.

**Keywords:** Ulcerative colitis, Molecular markers, Bioinformatics analysis, Novel diagnostic tests

## Evaluating the effectiveness of the study sonography of cervical segment of esophagus in patients with ulcerative colitis and gastro-oesophageal reflux disease

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**Aims:** Earlier we and other investigators have shown that sonographic evaluation of abdominal segment of esophagus can help in diagnosis of gastroesophageal reflux disease (GORD). The purpose of this study is to analyze if it is possible to find any morphofunctional changes in cervical segment of esophagus in UC and GORD patients by sonography.

**Methods:** 39 patients with ulcerative colitis ((UC) and verified GORD and 12 healthy subjects without any esophageal disorders during upper endoscopy were included in the study. Scanner Philips EnVisor HD with linear probe 12-3 MHz was used for ultrasonography. In decubitus position at the level of thyroid isthmus we have evaluated structure and thickness of mucosa and muscular layer of esophagus, presence of fluid and character of its movement, measured internal esophageal dimension. Then in upright position time of path of drink of standard chicken broth along esophagus was measured. After intake of 400-800 ml of chicken broth all measurements were repeated in decubitus position.

**Results:** Amongst all analyzed parameters statistically significant differences were detected in two: internal esophageal dimension in patients was larger than in healthy subjects and time of path of drink of standard chicken broth through esophagus was less (6.95 vs 4.41 mm post fast and 12.4 vs 9.3 mm after test meal; 1.78 vs 2.32 s post fast and 1.53 vs 2.68 s after test meal, respectively).

**Conclusion:**

1. Changes in two parameters in patients with GORD most likely are functional, not structural. They are related to esophageal tonic and motor activity disturbances.
2. Ultrasonography of cervical segment of esophagus can be useful in detection of GORD in patients with UC and in follow-up.

**Keywords:** Ultrasonography, Cervical segment esophagus, Ulcerative colitis, GORD, Detection

## Endoscopic Mayo score in ulcerative colitis with concomitant presence of primary sclerosing cholangitis

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**Aims:** Primary sclerosing cholangitis (PSC) with concomitant ulcerative colitis (UC) represents a distinct disease entity (PSC-UC). Endoscopic Mayo Score (EMS) is a standard tool for assessing inflammation in UC, however its relevance in PSC-UC remains uncertain. We sought to validate EMS in cohort of more than 30 patients with UC and PSC-UC.

**Methods**: Fifteen UC and 15 PSC-UC patients underwent colonoscopy and biopsy samples were collected from the ileum, cecum and rectum. Inflammation in biopsies was histologicaly assessed (score 0-3) and compared to EMS from colonoscopy. In addition, other relevant clinical characteristics (ANCA, calprotectin, and IgG4 levels, smoking, and body mass index (BMI)) were included in evaluation.

**Results:** PSC-UC group showed significantly lower EMS than UC alone (0.66 ± 0.81 vs. 1.6 ±, 0.82, $p < 0.01$). However, more than 50% bioptic samples from PSC-UC patients with EMS score "0" exhibited microscopic inflammatory changes of the UC type (8 out of 15 had affected cecum and 6 also rectum). Moreover, in PSC-UC group, a trend of a higher incidence of back-wash ileitis (27% vs. 7%) and more severe inflammatory involvement of the cecum was found when compared to UC (1.73 ± 0.59 vs. 0.73 ± 070, $p <0.001$). Fecal calprotectin levels were significantly higher in UC than in PSC-UC (600 ug / g (90-3612) vs. 104 ug / g (30 – 2190), $p < 0.05$). Both patients groups did not differ in any other of monitored parameters.

**Conclusion:** Commonly used EMS system fails to identify over 50% of PSC-UC patients with inflammatory changes clearly discernible by histological analysis. This indicates severe limitation of the standard MAYO score in the context of PSC-UC and suggests that histological evaluation should be an integral part of the diagnostic algorithm (Grant IN 17-3158A).

**Keywords:** IBD, ulcerative colitis, PSC-UC, Mayo score, endoscopy

## LIVER

### Bacterial infections in cirrhotic patients: Prognostic factors and management

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**Aims:** Bacterial infections are frequent in cirrhotic patients with a major risk of decompensations and mortality. Our main goals were to study the germs involved in cirrhotic infections and to study prognostic factors.

**Methods:** We conducted a retrospective study including cirrhotic patients hospitalized for a first infectious episode over a period of four years. We analyzed the bacteriological and evolutionary profile, as well as the prognostic factors of the infectious complication.

**Results:** Eighty patients were included. The mean age was 63 years with a sex ratio M/F of 1. The main infectious site were: urinary (31%), ascites (24%) and pulmonary (18%). The causative germ was found in 37 (46%) patients including Escherichia coli in 45% of cases. Gram-negative bacteria predominated over Gram-positive cocci (62% versus 35%). Multi-susceptible bacteria predominated over multi-resistant bacteria (51% versus 46%). Probabilistic antibiotic therapy was based on third generation cephalosporins in 44% of cases with clinical efficacy in 63% of cases. Secondary adaptation was needed in 35% of patients after antibiogram results. Short-term mortality rate was of 10%. Associated factors to high risk of mortality were: hepatic encephalopathy (p=0.002), variceal bleeding (p=0.004), metabolic acidosis (p=0.04), hepato-renal syndrome (p<0.0001) and septic shock (p<0.0001).

**Conclusion:** Infection is a common and severe complication during the course of cirrhosis. A better knowledge of the involved germs and the prognostic factors would optimize the management of antibiotic therapy, in order to avoid the selection of resistance and to improve survival.

**Keywords:** Cirrhosis, Bacterial infections

## Chronic fatigue in primary biliary cholangitis: Prevalence and characteristics

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**Aims:** Chronic fatigue is a common symptom in patients with primary biliary cholangitis (PBC) that can significantly impair their quality of life. In the absence of currently approved drug therapies targeting specifically fatigue as a symptom, the management of these patients can be very challenging. The aim of our study was to determine the prevalence of fatigue in PBC patients and to investigate the possible associated factors.

**Methods:** We conducted a retrospective study collecting all patients followed for PBC between 2000 and 2019. Patients with psychiatric or neoplastic diseases were excluded. The presence of chronic fatigue was systematically assessed. We recorded clinical, biological as well as the evolution under treatment. The Globe score, a prognostic tool predicting survival without transplantation, was calculated for all patients.

**Results:** A total of 58 patients were included. The mean age was 55 ± 14.25 years with a large female predominance (sex ratio: 6). Ursodeoxycholic acid was prescribed in 79% of patients. Biochemical remission after first-line treatment according to Paris II criteria was noted in 38% of patients and the mean globe score was 1.90 ± 1.50. One or more autoimmune diseases were associated with PBC in 33 patients (56%). Chronic fatigue was present in 15 patients, with a prevalence of 26%. On univariate analysis, there was no significant association between the presence of fatigue and the age, the gender, biological parameters, the severity of liver disease, the response to treatment nor the globe score. However, fatigue was significantly correlated with the presence of associated autoimmune diseases (p=0.022).

**Conclusion:** In our study, chronic fatigue does not seem to have a prognostic value. However, it was significantly associated with the presence of autoimmune diseases. Screening and early management of dysimmune diseases associated with PBC could help to improve this symptom and consequently the quality of life.

**Keywords:** Primary biliary cholangitis, Chronic fatigue

## Comparison of aminotransferase activity in patients with rhabdomyolysis due to acute intoxication with psychotropic and chemical substances

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**Aims:** We determine the aminotransferase activity in patients with rhabdomyolysis following acute intoxication with psychotropic and chemical substances.

**Methods:** In a clinically controlled prospective study, 140 patients with rhabdomyolysis were divided into two groups depending on the intoxicating substance i.e. psychotropic or chemical. Rhabdomyolysis was defined according to the poisoning severity score. To distinguish whether elevated AST and ALT are attributed only to muscle injury or concomitant liver damage, serum levels of AP, GGT, bilirubin, albumin, and prothrombin time were analyzed. Data were statistically analyzed in SPSS software, version 22.0 for Windows (SPSS, Chicago, IL, USA).

**Results:** In acutely intoxicated patients with rhabdomyolysis, 60% had increased AST values, in the group with psychotropic intoxications, AST values were elevated by 43%, and in the group, with chemical intoxication, 17% of the subjects had elevated AST levels. Patients with rhabdomyolysis due to psychotropic intoxication on the fifth day have significantly higher AST ($p = 0.0138$) and ALT ($p = 0.0129$) than patients with chemical intoxication. The CPK / AST correlation on the first day was significantly stronger in psychotropic compared to chemical intoxications ($p = 0.0009$). In psychotropic intoxications we found significant linear positive moderate correlation ($p = 0.0001$) and in chemical intoxications non-significant linear positive had a very weak correlation ($p = 0.003$). With increasing CPK, ALT was significantly increased in psychotropic intoxication and was slightly increased in patients with chemical intoxication.

**Conclusion:** Changes in AST and ALT values were correlated with CPK values, suggesting that elevated aminotransferases in rhabdomyolysis in those intoxicated with psychotropic substances may indicate skeletal muscle damage rather than hepatocyte damage. Elevated aminotransferases in chemical intoxications are due to the hepatotoxic effects of certain substances or can accompany severe clinical presentation with multiorgan failure. Intoxications with mushrooms, gasoline, corrosives, are the typical offending agent.

**Keywords:** aminotransferase, rhabdomyolysis, psychotropic substances, chemical substances

## The NAFLD-MS score: a novel score for the prediction of NAFLD in patients with metabolic syndrome

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**Introduction:** Non-alcoholic fatty liver disease (NAFLD) is a common pathology in patients with metabolic syndrome. Our study aimed to evaluate the NAFLD-MS score in the prediction of NAFLD in patients with metabolic syndrome.

**Methods:** This is a retrospective study that included patients with metabolic syndrome followed at the outpatient hepato-gastroenterology department of Mongi Slim Hospital. The diagnosis of NAFLD was confirmed by abdominal ultrasound. Fibrosis was assessed by Fib4 score in patients with NAFLD. The new NAFLD-MS score developed by a team of Thai physicians was calculated in all patients. It includes the following items: BMI ≥25Kg/$m^2$, AST/ALT ≥1, ALT ≥40, type 2 diabetes, and central obesity. This score ranged from 0 to 6.5.

**Results:** Two hundred and five patients were included in our study. The mean age was 50 years (+/-16). Type 2 diabetes was noted in 63 patients and hypertension was noted in 64 patients. 99% of the patients had a BMI >25Kg/$m^2$ and 88% had central obesity. The diagnosis of NAFLD was retained in 127 patients (62%). The NAFLD-MS score was calculated in 205 patients. The mean score was 3 [1-6.5]. The AUROC of this score in predicting NAFLD was 0.91. The cut-off of 3.25 had a sensitivity of 80%, a specificity of 90%, a positive predictive value of 92% and a negative predictive value of 88%. No patient with NAFLD had a score below 2. The AUROC of this score in predicting advanced fibrosis in patients with NAFLD was 0.68. A cut-off of 4.25 had a sensitivity of 75% and a specificity of 61%.

**Conclusions:** According to our study, the non-invasive NAFLD-MS score system performs well in predicting NAFLD in patients with metabolic syndrome. This score can help clinicians to take appropriate measures at an early stage to prevent progression to cirrhosis and its complications.

**Keywords:** NAFLD, Metabolic syndrome, NAFLD MS score

## Outcome of hepatitis c treatment with direct-acting antivirals after universal access to therapy

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**Introduction:** In our community up to 2016, treatment with direct-acting antivirals was limited to patients with advanced fibrosis, and from January 2017, treatment was allowed to all patients, regardless of their fibrosis stage.

**Objectives:** To assess changes in the profile of patients treated, and their impact on outcome.

**Methods:** We collected clinical data, virological characteristics, type of therapy and Sustained Virological Response from patients treated between 2014-2016 (prioritised treatment) and 2017- 2020 (universal access).

**Results:** We treated 1148 patients until June 2020, 361 between 2014-2016 and 787 between 2017- 2020. In both periods, the majority were male (although we see an increase in women in 2nd period, 35 vs 43%). The percentage of patients with fibrosis 3-4 was clearly higher in the first period (88.8), as expected due to the prioritisation policy, but in the 2nd period it still represents 30.6% of patients. Of these, 63.2 and 20.4% of patients had cirrhosis. We treated few patients with decompensated cirrhosis, most of them in the first period (10 vs. 2). Genotype 1 was the most prevalent in both periods. 28.8% of patients in the first period had received some previous treatment (vs 7.8% in the 2nd period). In the first period ribavirin was routinely used (67.6% vs 11.7%), pan-genotypic treatments were used in only 14.1% of patients (vs. 75.2%) and treatments were longer (8 weeks: 0 vs. 44.7%, 12 weeks: 66.5 vs. 52.2%, 24 weeks: 32.7 vs. 2.7%). SVR rate was slightly superior in the second period (99.1 vs 96.1%).

**Conclusions:** Despite having prioritised the treatment of patients with advanced fibrosis, these patients still represent one third of those subsequently treated. This should make us persevere in our efforts to identify patients with Hepatitis C. The advent of new, shorter duration pan-genotypic treatments has greatly simplified treatment and improved SVR rates.

**Keywords:** Prioritised treatment, Sustained Virological Response, Advanced Disease, Hepatitis C

## How well are we performing Paracentesis?

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**Aims:** The underlying cause of ascites includes cirrhosis, malignancy and infections. Paracentesis is utilised in patients with large or refractory ascites. Irrespective of the underlying cause, the drain should remain in-situ for maximum 6 hours to reduce the complication rate. We reviewed patients in our institution who have undergone therapeutic paracentesis and assessed whether we're adequately managing the drains.

**Methods:** This was a single centre retrospective study. We identified in-patients undergoing therapeutic paracentesis, via radiology (using the code 'US guided drainage abdomen') or ward-based (using previous ward lists) from June 2019-December 2019. We interrogated patients notes and predominantly looked at cause of ascites, documentation of drain insertion, duration the drain should remain in-situ and complications.

**Results:** We identified 35 patients undergoing therapeutic paracentesis during our study period. The average age 67, 41% female. The indication in 14/35 patients was cirrhosis. Only 10/35 (28%) patients had adequate documentation regarding the drain (instructions regarding duration of drain and whether HAS is required). The average drain duration was 64 hours, with the average amongst cirrhotics being 15 hours (3–72). The documented complication rate was high at 23% (8/34), with half of those complications documented as leaking from the drain site.

**Conclusion:** We conclude there is high variability in care and documentation of patients requiring paracentesis. We aren't documenting an accurate plan, highlighted by the fact that 72% of patients had inadequate documentation. This could be the main reason that drains are left in-situ for longer than the recommended 6 hours. Contributing to this could be the common misconception amongst physicians that if the drain is for malignancy the drain can stay in until dryness, or longer than 6 hours. The longer the drain remains in-situ, the higher the complication rate, indicated by fistula formation (leakage) in half the patient with complications. This study highlights the need for widespread trust guidance on ascitic drain insertion and management.

**Keywords:** Ascitic drain, paracentesis, cirrhosis

## Sarcopenia as a predictor of mortality and complications in cirrhosis patients-a prospective cohort study

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**Introduction:** Sarcopenia is a promising tool for prognostication of cirrhosis. EWGSOP2 guidelines define sarcopenia based on muscle strength, muscle quantity or quality and physical performance. Many previous studies didn't use a standardized definition of sarcopenia and was based on skeletal muscle measurement by CT or MRI. Ultrasound guided thigh muscle thickness (TMT) measurement is a validated, cost effective and easy method for assessment of muscle quantity. There is paucity of Indian studies analysing prognostic role of sarcopenia in cirrhosis.

**Aim:** To study the predictive role of sarcopenia on mortality and complications in cirrhosis patients.

**Methods:** This was a prospective cohort study with 120 consecutive patients each in sarcopenia and no sarcopenia groups. Sarcopenia was diagnosed based on EWGSOP2 guidelines using ultrasound guided measurement of TMT. They were followed up for 6 months. Kaplan-Meier analysis with LogRank test was used to compare survival and Cox proportional hazards model was used for multivariate analysis to determine risk factors of mortality.

**Results:** Cirrhosis patients with sarcopenia [$N_1$=120,M:F=80:40, Median age 58 yrs (51–64)] and without sarcopenia [$N_2$=120,M:F=93:27, Median age 54 yrs (46.25–60)] were enrolled. Six-month cumulative survival was 56.7% and 76.7% in sarcopenia and no sarcopenia groups respectively(p=0.001). Six month cumulative survival in severe and non-severe sarcopenia was 23.9% and 70% respectively(p=0.001). Age, sex, nutritional status, sarcopenia status, CTP score, MELD score, Bilirubin, Albumin, INR and Sodium were significantly associated with survival. A multivariate analysis showed sarcopenia (HR=1.283, 95%CI 1.092–2.130, p=0.031), female sex (HR=1.851, 95%CI 1.106–3.097, p=0.019), CTP class C (HR=1.447, 95%CI 1.252–1.794, p=0.002) and MELD score>15(HR=1.116, 95%CI 1.056–2.203, p=0.05) as independent predictors of mortality. Development of complications like ascites, HE, Covid infection and UGI bleed were significantly higher in sarcopenia group, while SBP, AKI, cellulitis, UTI, HCC and ACLF were not statistically significant between two groups.

**Conclusion:** Sarcopenia is an independent prognostic marker of mortality in cirrhosis and is associated with increased risk of complications like ascites, HE, Covid infection and UGI bleed. Severe sarcopenia has even poorer outcome. It appears that addition of sarcopenia to existing scoring systems of cirrhosis will improve prognostication of patients.

**Keywords:** CIRRHOSIS, SARCOPENIA, THIGH MUSCLE THICKNESS, PROGNOSTIC TOOL

## Wilson's disease and hepatocellular carcinoma – five case reports

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Wilson disease (WD) is a rare, inherited disorder of copper metabolism characterized by an impaired biliary copper excretion. Copper accumulation causes progressive liver damage and neurological impairment. The spectrum of WD manifestations is highly variable. Hepatocellular carcinoma (HCC) seems to be an uncommon event in WD patients.

**Aims:** Our purpose was to report five cases with both HCC and WD in one and the same patient.

**Methods:** The study included 113 patients with confirmed diagnosis of WD (Leipzig score ≥4) treated at the Clinic of Hepatogastroenterology, Medical University of Varna, Bulgaria, between January 2000 and November 2020. Occurrence, treatment and outcome of HCC were analysed retrospectively.

**Results:** During the follow-up five out of a total of 113 WD patients (4.42%), four males and one female, developed HCC. All of them presented with liver cirrhosis. In two men and in the woman, there was liver and neurological disease in common. Chronic viral C hepatitis was diagnosed in one patient, too. Time lag between WD and HCC diagnosis varied between 2 and 36 years. The patient with viral C hepatitis did not undergo any regular decoppering and antiviral treatment and was lost from observation. The rest patients underwent surgery for HCC. One of them died eight years after HCC diagnosis. He developed pulmonary and liver metastases that regressed during the conventional chemotherapy and target treatment with Sorafenib. Later on, additional metastases in the retroperitoneum expanded to the bladder and pelvic bones. The other three patients died within several months after the operation.

**Conclusion:** According to literature data available and our own experience, the combination of WD and HCC is very seldom, even in cirrhotic patients. The influence of decoppering therapy on tumor activity remains to be elucidated. However, uninterrupted HCC monitoring is required, especially in patients with WD liver cirrhosis.

**Keywords:** Wilson's disease, hepatocellular carcinoma, decoppering therapy

## External Validation of UDCA Response Score in a joined cohort of Slovak and Croatian Patients with Primary Biliary Cholangitis

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**Background:** Ursodeoxycholic acid response score (URS) is a prognostic model which was developed to estimate the baseline probability of response after 12 months of ursodeoxycholic acid (UDCA) therapy in patients with primary biliary cholangitis (PBC).

**Aim:** To independently evaluate the prognostic performance of the URS.

**Methods:** We used a joined cohort of Slovak and Croatian treatment-naïve PBC patients to quantify the discrimination ability using the area under the receiver operating characteristic curve (AUROC) and its 95% confidence interval (CI). We also evaluated the calibration using the calibration belts. The primary outcome was treatment response after 12 months of UDCA therapy defined as alkaline phosphatase ≤1.67 × upper limit of normal.

**Results:** We included one hundred and ninety-four patients in the final analysis. Treatment response was achieved in 79.38% of patients. AUROC of the URS was 0.81 (95% CI 0.73-0.88) and the calibration belt revealed that the model correctly estimates response rates.

**Conclusion:** Our results show that the URS can be used in treatment-naïve PBC patients for estimating the treatment response probability after 12 months of UDCA therapy.

**Keywords:** primary biliary cholangitis, treatment response, ursodeoxycholic acid, obeticholic acid, bezafibrate

## Acute pancreatitis in patients after liver transplantation

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**Introduction:** Acute pancreatitis (AP) is a relatively rare but serious complication that can occur after organ transplantation.

**Aim and methods:** The aim of this study was to evaluate the incidence, potential risk factors and course of AP in patients following liver transplantation at a single large-volume transplant centre.

**Results:** Out of a total of 1850 transplanted patients, 49 (2.8%) were diagnosed with AP. Of this group, 37 (75.5%) exhibited a mild form of AP and 12 (24.5%) a severe form of AP. The mortality rate was 10% overall and 42% in the group of patients with severe AP. An early form of AP (<30 days from transplantation) occurred in 13 patients (26.5%), most of whom presented with severe AP (10 patients, 76.9%); 4 patients died (40%). A late form of AP was diagnosed in 36 patients (73.5%), most of whom exhibited mild AP (34 patients, 94.4%); one of two patients with severe AP died. The most common AP aetiologies were post-ERCP (38.8%), idiopathic (34.7%) and post-operative (18.4%). Chronic HBV infection proved a risk factor for the development of AP (p=0.01).

**Conclusion:** AP in liver transplant recipients was more frequent and more severe than in the general population. This unfavourable course was associated with the occurrence of AP in the early post-transplant period. Liver transplantation due to complications of HBV infection proved a risk factor for the development of AP.

**Keywords:** Acute pancreatitis, Liver transplantation, Hepatitis B virus

## Quantitative analysis of hepatic cancer stem cell markers of hepatocellular carcinoma after locoregional therapies exhibits upregulation after TACE only

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**Aims**: Hypoxia is known to modulate stemness of hepatocellular cancer (HCC) which is associated with poor clinical outcomes. Transarterial chemoembolization (TACE) and transarterial radioembolization (TARE) has different effect on tumor hypoxia. In this study, we evaluated expression of cancer stem cell (CSC) and hypoxia markers in the residual tumors after locoregional therapies.

**Methods**: HCC and paired peritumor tissues from TACE (n=7), TARE (n=4) and Non-treat (n=4) patients underwent immunohistochemistry (IHC) for stem cells (CD24, EpCAM, CD133) and hypoxia (CAIX) markers. Quantitative assessment of staining utilized the Fiji program.

**Results**: Expression of CSC markers (CD24 and EpCAM) and hypoxia marker (CAIX) was significantly upregulated in TACE-T (tumor from TACE) compared to TARE-T (tumor from TARE) and NT-T (tumor from Non-treat). Levels of CD24, EpCAM, and CAIX were higher in TACE-T than TACE-pT (peritumor). The significant increase of CD24 and EpCAM expression displayed in the tumor nodule of TACE-T compared to TARE-T and NT-T, not in the stroma. CD24 and EpCAM had strong cytoplasmic and membranous staining pattern while strong expression of CD24 and EpCAM was present in ductules and ductular hepatocytes. CD133 expression showed higher in TACE-T than TACE-pT and no significant difference among TACE-T, TARE-T, and NT-T. CD133 expression pattern was distinctive and limited only on apical membrane of tumor cells facing lumen of bile canaliculi, not basolateral membrane facing sinusoids. Diversity of CSC population was revealed by Pearson's correlation analysis present between CD24/CD133, CD24/EpCAM, but not between CD133/EpCAM. However, degree of CAIX expression was well correlated with all CSC markers: CD24, CD133 and EpCAM.

**Conclusion**: Each locoregional therapy has differential specific effect on hepatic CSC markers expression in HCC. TACE-induced hypoxia may select CSC and an aggressive HCC phenotype. Therefore, checking the expression status of these markers in HCC may help stratify patients for recurrence or progression risk.

## Could eryhrocytapheresis be an effective treatment option for aceruloplasminemia?

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**Background and Aims:** Aceruloplasminemia is a rare autosomal recessive disorder, characterised by dysfunction of ceruloplasmin and subsequent iron accumulation. It is characterised by the triad of diabetes mellitus, retinal degeneration and neurological symptoms. Our patient is a first case of aceruloplasminemia diagnosed in Croatia and one of the youngest patients, 29 years old, so far reported worldwide. Experience with treatment options is limited and mostly included iron chelation therapy, burdened with side effects.

**Method:** A young male patient was referred to us with a history of an episode of presyncope, and laboratory finding of high ferritin levels. Additional tests revealed almost undetectable levels of ceruloplasmin. Genetic analyses for Wilson's disease and hemochromatosis were negative, and his ophthalmological status and brain and abdominal MRI revealed no significant pathology. Liver biopsy found no excess copper content but discrete hemosiderin deposits were found. Diagnosis of aceruloplasminemia was established.

**Results:** High ferritin levels (825 mcg/L) and already present discrete deposits of hemosiderin in the liver tissue, led to a decision to perform a venipuncture which resulted in minor ferritin decrease (761 mcg/L). Considering the age of a patient and estimation of a necessity for a lifelong treatment, we decided erythrocytapheresis to be a better option comparing to chelation or venipuncture. After a three procedures ferritin level was 272 mcg/L. In a three year follow up the patient didn't develop any signs of illness. Ferritin levels are kept within a normal range with once a year need for erythrocytapheresis.

**Conclusion:** We should consider aceruloplasminemia as a differential diagnosis of iron overload disorders. It would be optimal to start treatment before symptoms develop. Erythrocytapheresis could be a good treatment option, since it has minor if any side effects, and according to our data it is effective in keeping ferritin in normal range.

**Keywords:** aceruloplasminemia, iron overload, erythrocytapheresis

## Positive and negative mutual influence between gallstone disease and non-alcoholic fatty liver disease

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**Aim:** To assess positive and negative mutual influence of patients with NAFLD with/without GD to improve the quality of management and treatment.

**Methods:** A total of 183 patients with NAFLD were included in this case control study. The main group was represented by patients with NAFLD and GD (n = 88), of which 53 underwent cholecystectomy. The comparison group was represented by patients with NAFLD without GD (n = 95). All patients underwent standard laboratory testing to assess level of related hormones (i.e. leptin, its soluble receptor, adiponectin, and insulin) and instrumental examinations to assess fatty liver and stage of liver fibrosis (i.e. abdominal ultrasonography and elastometry). Processing of research results was conducted with the Python programming language and the specialized data analysis libraries (NumPy and Pandas). Fuzzy logic and fuzzy rules were used to describe the relationship between risks and disease course.

**Results:** Compared to patients with NAFLD without GD, those with NAFLD and GD presented coronary heart disease (9.47% vs 25%, $P \leq 0.01$), and type 2 diabetes ($rs = 0.164$, $P \leq 0.01$). Individuals after cholecystectomy showed higher levels of LDL ($rs = 0.228$, $P \leq 0.01$) and GGT ($rs = 0.298$, $P \leq 0.01$). Leptin level was positively correlated with cholecystectomy ($rs = 0.336$, $P \leq 0.01$). The NAFLD and GD patients also showed greater advanced fibrosis (26.31%), especially those who had undergone cholecystectomy (30.18%). Stage of liver fibrosis was also positively correlated with cholecystectomy ($rs = 0.366$, $P \leq 0.01$).

**Conclusion:** Comorbid course of NAFLD and GD is characterized by clinical and laboratory features that may be associated with metabolic disorders, particularly imbalanced adipose tissue hormones. Accordingly, we developed a decision support system to assess possibility of cholecystectomy; a positive decision on surgery may increase adverse risk of cardiovascular diseases and NAFLD progression in patients with high LDL and leptin level.

**Keywords:** non-alcoholic fatty liver disease, metabolic risks, gallstone disease, cholecystectomy, adipokines

## Gut microbiota and NAFLD: what does this competition mean?

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**Aims:** The aim of this study was to present the difference between NAFLD microbiota and microbiota of healthy subjects. Especially, in current presence of SIBO and pro inflammatory factors.

**Methods:** The study included 54 patients with NAFLD (34 men, 20 women), average age 46.64±2.52. The control group involved 32 almost healthy subjects (14 men, 18 women), average age 32±1.54. Both groups of patients underwent such biochemical evaluation. The diagnosis of fatty liver infiltration was based on liver transient elastography. All subjects were examined by a lactulose breath test (LBT). Determination of microbial composition was carried out by identification of total bacterial DNA, and DNA of Bacteroidetes, Firmicutes and Actinobacteria was performed with quantitative real-time PCR (qRT-PCR), using gene-targeted primers.

**Results:** The prevalence of SIBO in patients with NAFLD was 51.2% in contrast with control patients – 13,8%. The negative correlational relationship was marked in NAFLD group between Bacteroidetes and Firmicutes (r=-0.68), Bacteroidetes and Actinobacteria (r=-0.56), Bacteroidetes and F/B index (r=-.056). Actinobacteria in NAFLD group correlated with TNF-a (r=0.41, p<0.05). F/B index was in strong relationship with ALT (r=0.61, p<0.05), TG (r=0.53, p<0.05), VLDL (r=0.4, p<0.05). Controls: Actinobacteria was in correlation with Apo-A1 (r=0.74), Apo-B (r=-0.74). The correlational relationship was marked between Bacteroidetes and Apo-A1 (r=-0.43), Apo-B (r=0.44). F/B index was in strong correlation with Apo-B (r=-0.61), Apo-A1 (r=0.6).

**Conclusion:** Thus, controversial factors of NAFLD are on the fact that the microbiota archetype could be the part of pathologic process, while in healthy subjects the same bacteria will play the preventing role. Actinobacteries rise up the Apo A1, and down to Apo B with positive correlation between Apo-1 and Bacteroidetes. On the same time, Actinobacteriaes in NAFLD group correlated with TNF-a. Thus, we can suggest the strong impact of kind of microbiota on healthy subject and NAFLD patient in perspective of health of liver, especially NAFLD.

**Keywords:** non-alcoholic fatty liver disease, gut microbiota, steatosis, steatohepatitis, Firmicutes

## Gut microbiota and non-alcoholic fatty liver disease: the imminent threat or eminent care?

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**Aims:** The aim of study was to analyze the gut microbiota composition with profound analysis of its potential connection with biochemical factors in patients with non-alcoholic fatty liver disease (NAFLD) and healthy subjects.

**Methods:** The study included 54 patients with NAFLD (34 men, 20 women), average age 46.64±2.52. The control group involved 32 almost healthy subjects (14 men, 18 women), average age 32±1.54. Both groups of patients underwent such biochemical evaluation of serum as blood cell count, lipid profile, C-reactive protein, ALT, AST, GGTP, bilirubin, urea, uric acid, albumin, total protein, TNF-a, HOMA index. The diagnosis of fatty liver infiltration was based on liver transient elastography. Determination of microbial composition was carried out by identification of total bacterial DNA, and DNA of Bacteroidetes, Firmicutes and Actinobacteria was performed with quantitative real-time PCR (qRT-PCR), using gene-targeted primers.

**Results:** The composition of microbiota in patients with NAFLD was: Bacteroidetes 21.1±3.4, Firmicutes 40.6±2.7, Actinobacteria 22.1±3.4, Other 16.1±2.9, F/B index 4±0.9. In controls – Bacteroidetes 45.5±5.5, Firmicutes 33.7±3.4, Actinobacteria 14.5±2.7, Other 6.2±0.7, F/B index 1.8±0.4. The negative correlational relationship was marked in NAFLD group between Bacteroidetes and Firmicutes (r=-0.68), Bacteroidetes and Actinobacteria (r=-0.56), Bacteroidetes and F/B index (r=-.056). Actinobacteria in NAFLD group correlated with TNF-a (r=0.41, p<0.05). F/B index was in strong relationship with ALT (r=0.61, p<0.05), TG (r=0.53, p<0.05), VLDL (r=0.4, p<0.05).

**Conclusion:** Actinobacteria range and F/B index in patients with NAFLD was above than in patients of control group. Bacteroidetes level in controls was significantly higher than in patients with NAFLD. The Actinobacteria growth in patients with NAFLD could provoke the rise of TNF-a – one of the main factors of non-alcoholic steatohepatitis development. F/B index was associated with such inflammation markers as ALT and TG. Actinobacteria and F/B index increasing could be presented as one of the risk factors for fatty liver injuring in patients with NAFLD.

**Keywords:** non-alcoholic fatty liver disease, gut microbiota, steatosis, sheatohepatitis

## Gut microbiota and SIBO in NAFLD patients

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**Aims were** to analyze the gut microbiota composition in patients with NAFLD with possible examination of aggressive and protective factors, including SIBO existence and biochemical markers.

**Methods included** 43 patients with NAFLD with average age 46.97 ± 2.53. and BMI 27.43 ± 0.74. All patients underwent biochemical evaluation – lipid profile, C-reactive protein, ALT, AST, GGTP, CRP, bilirubin, apolipoprotein B, apolipoprotein A1. Determination of microbial composition at the level of major microbial phyla was carried out by identification of total bacterial DNA, and DNA of Bacteroidetes, Firmicutes and Actinobacteria was performed with quantitative real-time PCR (qRT-PCR). Ultrasound examination and liver elastography was proved to all patients. All subjects were examined by a lactulose breath test (LBT).

**Results:** The prevalence of SIBO in patients with NAFLD was 51.2%. The percent of microbiota composition was – Bacteroidetes 16.7 ± 2.99, Firmicutes – 45.3 ± 2.99, Actinobacteria – 25.9 ± 1.9, Firmicutes/Bacteroidetes ratio (F/B) – 6.47 ± 1.55.). Strong positive correlation among F/B index and triglycerides (r = 0.42) and ALT (r = 0.4). Additionally, there was middle-strong correlation between SIBO existence and Firmicutes increasing in patients with NAFLD (r = 0.39). Most of the studies, show the potential exacerbating influence Firmicutes on the fatty infiltration progression. Some of the data suggests to include the F/B index to the list of early markers of NAFLD. There is an interesting point in SIBO existence and its connection with Firmicutes by widely-spread fact that SIBO is associated with gram-negative microbiota, to which Firmicutes do not belong.

**Conclusion:** We can suggest, that there is a violation in composition of some species of bacteria, not phyla, are leading to SIBO occurrence in the background of NAFLD and it could be not only gram-negative bacteria, but gram-positive, that are associated with NAFLD.

**Keywords:** Microbiota, Non-alcoholic fatty liver disease, NAFLD, Steatosis, SIBO

## Clinical Associations and Prognostic Significance of Raised Serum Ammonia

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**Aim:** Although associated with hepatic encephalopathy (HE), there are numerous non-hepatic causes of hyperammonaemia. The lability of ammonia requires arrival of the sample at the laboratory within fifteen minutes, and interpretation of results is challenging. We aimed to review the significance of elevated serum ammonia in clinical practice.

**Methods:** Adult in-patients with serum ammonia levels ≥50umol/l between January 2018 and December 2019 at Glasgow Royal Infirmary were identified. Clinical characteristics at sampling time were recorded, as were subsequent outcomes. Renal impairment was defined as creatinine >130umol/l. Follow-up was until December 2020. Spearman's correlation and area-under the curve (AUC) analysis was used: 95% confidence intervals shown.

**Results:** 143 patients with hyperammonaemia were identified. 77 were male (53.8%), mean age 55.4. Commonest indications for sampling were suspected HE (50%) and low GCS/confusion/agitation (37.1%). Mean sample delivery time was 96 minutes (78–114); 10.4% arrived within fifteen minutes.

75 patients (52.4%) had recognised non-hepatic causes of hyperammonaemia, including: urease-producing bacteria (3.5%), seizures (18.9%), valproate/carbamazepine use (14.0%) and renal impairment (17.5%). No cause identified in 11.9%.

Of 91 cirrhotic patients (63.6%), the most common aetiology was alcohol-related (72.7%). In this cohort, mean MELD-Na score was 20 (18,22), with no correlation between serum ammonia and MELD-Na scores (p=0.223; -0.09,0.33).

Overall, 90-day mortality was 31.5%. Ammonia was a poor predictor of survival (AUC 0.613; 0.509,0.704), although levels were lower in 90-day survivors: 77.5 (69,93.5) vs 99 (83.5,113.7) umol/l: p=0.03. The presence of sepsis was associated with higher mortality: 55.8% vs 21%: p<0.0001.

**Conclusion:** Most patients with hyperammonaemia had cirrhosis – however, non-hepatic causes were identified in over half of all cases. Hyperammonaemia was poorly predictive of outcome and unrelated to other indicators of liver disease severity. Most samples were not received within recommended time frame, casting doubt on their interpretation. The significance of hyperammonaemia in clinical practice is questionable.

**Keywords:** hyperammonaemia, ammonia, hepatic encephalopathy, cirrhosis, biochemistry

## Clinical significance of contrast-Enhanced Intraoperative Ultrasonography in patients with colorectal liver metastases after chemotherapy

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**Aims:** The study aimed to assess the usefulness of contrast-enhanced intraoperative ultrasonography (CE-IOUS) in colorectal liver metastases (CRLM).

**Methods:** A prospective analysis of CRLM patients who underwent hepatectomy and/or ablation during neo-adjuvant chemotherapy from April 2021 to September 2021 was conducted. Pre-operative imaging included gadolinium ethoxybenzyl diethylenetriamine pentaacetic acid-enhanced magnetic resonance imaging (EOB-MRI) and/or contrast-enhanced multi-detector computed tomography (MDCT). At surgery, intraoperative ultrasonography (IOUS) and CE-IOUS with Sonazoid were performed by surgeon. The diagnostic accuracy of CE-IOUS were assessed.

**Results:** A total of 46 patients were enrolled. 187 lesions were identified in preoperative imaging. In IOUS, 225 lesions and 21 new lesions (6 patients) were identified. In CE-IOUS, 47 additional lesions (15 patients) were newly identified, 46.8% (22/47) of which were finally diagnosed as CRLMs. And 12 lesions (25.5%) were treated with thermoablation. The sensitivity, accuracy and positive-predictive value (PPV) of CE-IOUS were 99.1%, 95.5% and 96.3%, respectively.

**Conclusions:** CE-IOUS using Sonazoid can increased the detectability of liver metastasis and change the treatment strategy.

**Keywords:** colorectal liver metastasis, contrast-enhanced intraoperative ultrasound, Sonazoid

## Nonalcoholic Fatty Liver Scoring Panels shortcut for Fibro Scanning results or not

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**Background & Aims:** Liver steatosis has a wide range of conditions from simple steatosis to non-alcoholic steatohepatitis, fibrosis, and eventually cirrhosis. Several panels and scoring systems have been introduced to differentiate steatosis with or without advanced fibrosis and also the degree of fibrosis. This study aimed to evaluate eleven different scoring panels in patients with steatosis and compare their results with Fibro Scan.

**Methods:** The study was performed on 122 steatosis patients who confirmed by ultrasound and visited the gastroenterology clinic of Rasht Razi Hospital from September 2017 to April 2018. All patients underwent Fibro Scan. Multiple scoring systems were calculated using the laboratory values. These results were compared with the results of the Fibro Scan. AUC for each panel was calculated. SPSS 22 was used for statistical analysis. P-values less than 0.05 were considered significant.

**Results:** Out of 122 patients, 60 (49.1%) were women and 62 (50.8%) were men. The mean age of the patients was 47.1±11.7 years. There were significant differences between patients with or without advanced fibrosis in three panels of APRI, NIPPON, and FIB4 (p=0.03, p=0.01, p=0.005, respectively). AUROC for APRI, NIPPON, and FIB4 were, 0.695 (CI=0.58-0.8, p=0.001), 0.642 (CI: 0.5-0.74, p=0.015) and 0.684 (CI: 0.5-0.7, p=0.002), respectively. None of the other panels had enough sensitivity for the diagnosis of advanced fibrosis.

**Conclusion:** Given the cost-effectiveness of panels, their ease of calculation, and non-invasiveness, FIB4, NIPPON, and APRI can be used as useful tools for following and also for predicting progression to advanced fibrosis.

**Keywords:** Non-alcoholic Fatty Liver Disease, Diagnosis, Guilan

## A new non-invasive test with the potential to liver metabolic dysfunction assess

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Metabolic dysfunction associated fatty liver disease is actively discussed. On the other hand, liver is the main organ providing metabolic switching energy metabolism from glucogenosis to ketogenosis. These lines of evidence suggest that a metabolic plasticity directly relating to metabolic dysfunction associated fatty liver disease. Thus, it becomes important to determine liver response to the inducer of metabolic switching from glucogenosis to ketogenosis. Such inducers can be ketogenic amino acids. But, there are contradictions in the publications concerning its ketogenic. Others point out that: lysine and leucine are ketogenic only. PubMed, Science Direct, CINAHL, MEDLINE, Alt Health Watch, Food Science Source and EBSCO Psychology and Behavioural Sciences Collection electronic databases were searched online with the terms "ketogenic lysine", “lysine ketosis” and “lysine ketonaemia (ketonemia)”, "Lysine/metabolism" AND ketosis” “lysine ketogenic effect” with for all “human”. Unexpected result – no study found in humans

**Aim:** To clarify whether humans have a ketogenic effect of the amino acid L-lysine.

**Methods:** Volunteers (without any known metabolic disturbances) were orally given lysine 2,0 g. Baseline ketosis and on 30, 60, 90, 120, 150, 180 min after lysine consumption was measured by KETONIX® device (FDA Status- Registered Class 1). Statistical analysis was done with NCSS 2021, v21.0.2 (NCSS LLC, UT, USA).

**Results:** 17 adults voluntarily agreed to take part in the study: 16 women and 1 man. The age of the volunteers was mean – 42,5 (95%CI = 36,0 – 49,1), median – 43 (32 – 57,5 percentile). The main results are presented in Table 1.

Table 1 – Results of the ketosis kinetics induced by ingestion of 2 grams of the amino acid L-lysine

| | AUC | ppm Basic | ppm Max | Time Max in minutes |
|---|---|---|---|---|
| **Mean** | 3780 | 3,3 | 37,1 | 114 |
| **Standard Error** | 873,1 | 0,7 | 7,5 | 14,7 |
| **Lower 95% CL Mean** | 1804,8 | 1,8 | 20,1 | 80,7 |
| **Upper 95% CL Mean** | 5755,2 | 4,8 | 54,1 | 147,2 |
| **Median** | 2632,5 | 3,5 | 35,5 | 120 |
| **25th Percentile** | 1650 | 1 | 17,5 | 82,5 |
| **75th Percentile** | 5542,5 | 5,2 | 46,75 | 150 |

Individual intensity (rate ppm/minute) were: in 30% – 1,0 and more (fast inductors), in other cases from 0,1 to 0,4 (medium inductors).

**Conclusion:** For the first time, results obtained by breath analysis show that lysine have significant ketogenic effect in humans, comparable in intensity with ketosis induced by a ketogenic diet and exogenous ketones and the lysine ketogenic test can potentially be used to assess liver metabolic dysfunction. Of course, further research is required to clarify the significance of the ketogenic test with lysine.

**Keywords:** liver, metabolic dysfunction, ketosis, l-lysine

## The diagnostic accuracy of an estimate of insulin resistance for the detection of fatty liver disease in subjects with type 1 diabetes

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**Introduction:** Non-alcoholic fatty liver disease (NAFLD) is a chronic condition characterized by intrahepatic fat accumulation, which can evolve to steatohepatitis (NASH) and/or significant fibrosis. NAFLD is associated with cardiovascular disease (CVD). While this risk is mostly related to NASH, evidence is growing that even simple steatosis can affect cardiovascular morbidity. Diagnosis of NAFLD is challenging, since biopsy remains the golden standard. Insulin resistance (IR) is associated with NAFLD and could act as a predictor of NAFLD. The estimated glucose disposal rate (eGDR) is validated against the euglycemic clamp technique, which is the gold standard for T1DM subjects.

**Aims:** To assess the predictive accuracy of the eGDR for the diagnosis of NAFLD in T1DM.

**Methods:** 296 T1DM were consecutively ultrasonographically screened for NAFLD. eGDR was calculated as follows: eGDR (mg/kg/min) = 21.158+(-0.09*waist circumference(cm)) + (-3.407*hypertension) + (-0.551*HbA1c (%)). Low eGDR represents increased IR. We transformed the eGDR to eGDR-1 for statistical analysis. We used the area under the receiver-operating characteristic curve (AUROC) and Youden's Index (YI) to determine the diagnostic accuracy and optimal threshold.

**Results:** Prevalence of steatosis was 20.6 %. Median age of subjects was 48 years (18-88), median diabetes duration was 27 years (1-61). The mean HbA1c was 7.6±1.0 %, mean waist circumference: 91.7±14.6 cm. Mean eGDR-1: 0.13±0.07 (mg/kg/min)-1. The AUROC of eGDR-1 for the diagnosis of steatosis was 0.76 (95%CI:0.69-0.83, p<0.001). Optimal cutoff, according to the YI, was 0.121 (mg/kg/min)-1 (sensitivity 0.80, specificity 0.70). Using this threshold, PPV (49/119) was 41.2%, NPV (164/176) was 93.2%. Independent risk factors for steatosis were eGDR-1 >0.121 (mg/kg/min)-1 (OR:4.4, p=0.001) and BMI (OR:1.15, p=0.001), but not age, diabetes duration and gender.

**Conclusion:** the eGDR shows good accuracy for the diagnosis of NAFLD in T1DM, with excellent NPV. The eGDR is independently associated with increased risk for hepatic steatosis.

**Keywords:** NAFLD, Insulin resistance, Cardiovascular disease, Type 1 diabetes

## Lok Score as a non-invasive predictor of Oesophageal Varices in Cirrhotic patients

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**Introduction:** Cirrhosis of liver is one of the most common diseases among various clinical problems. Oesophageal varices are major complications of portal hypertension due to cirrhosis of liver. Ruptured oesophageal varices impact on prognosis of cirrhotic patients. This study was performed to evaluate accuracy of Lok score in detecting the oesophageal varices in cirrhosis of liver.

**Aim:** To study the Lok score as a non-invasive predictor of oesophageal varices in patients with cirrhosis of liver

**Method:** This study is hospital-based cross-sectional study. Data were collected from cirrohtic patients who underwent OGDS (Oesophagogastroduodenoscopy) at Gastroenterology Department of Yangon General Hospital within 1 year starting from January 2017 who met inclusion criteria. History taking and physical examination were done. Blood samples for platelet count, liver enzymes (Alanine aminotransferase, Aspartate aminotransferase) and international normalized ratio were sent to Yangon General Hospital laboratory for calculation of Lok score. OGDS was done on these patients for assessment of oesophageal varices.

**Results:** Among 84 studied patients, 56 patients (66.7%) were male and only 28 patients (33.3%) were female. So, prevalence of cirrhosis was much higher in men than in women and commonest underlying aetiology of cirrhosis was alcohol. In this study, majority of patients were 41-50 years age group and oesophageal varices were more common in this age group and so cirrhosis of liver was common disease of working-age group. In this study, mean values of Lok score were compared to the grading of oesophageal varices and the cut-off value of Lok score in prediction of the presence of oesophageal varices and large oesophageal varices was suggested according to statistical data.

**Conclusion:** These findings showed that Lok score might be a useful non-invasive predictor of presence of oesophageal varices and also that of large oesophageal varices in the future.

**Keywords:** Lok Score, oesophageal varices, cirrhotic patients, non-invasive predictor, cirrhosis

## Analysis of food patterns in patients with NAFLD reveals difference in structure of consumed vegetables, fruits and fats

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**Aim**: to evaluate nutritional patterns in patients with NAFLD in comparison to the control group without the disease.

**Methods**: Blinded to patients´ personal details retrospective database search (Nutrilogic, Russia) for unique records of patients aged 18-75 y.o. with complete data about their demography and nutritional assessment with the use of food frequency method was performed. The patients were divided on NAFLD (in case the condition was present) and the control group (no mention of the disease). Nutritional patterns were assessed in accordance to “healthy eating pyramid” principles for the following main groups of products: grains, fruits, vegetables, dairy products, meats, fats and confectioneries. Non-parametric statistics was used to perform the comparison of the main and the control group.

**Results:** Data of 251 with NAFLD and 62 controls were available for the final analysis. Comparison of the main food groups' consumption revealed larger amounts of intake of dairy products and meats in NAFLD group compared to control. NAFLD patients consumed more potatoes (0.15±0.20 vs 0.07±0.09, *p*=0.001), onions (0.06±0.09 vs 0.05±0.10, p=0.006), and cabbage (0.14±0.17 vs 0.11±0.21, p=0.005), then controls. However, the structure of beans, root crops, leafy and other vegetables consumption did not differ between the groups. Patients with NAFLD eat more fruits and fruit products, containing larger amounts of sugars: melons (0.06±0.19 vs 0.02±0.08 in the control group, p=0.001), citruses (0.11±0.15 vs 0.10±0.17, p=0.001). The structure of fats consumption significantly differed by animal fats (0.10±0.30 in NAFLD, 0.008±0.02 in the control group, p=0.001) but did not differ by rates of vegetable oils, margarines and butter consumption.

**Conclusion:** Nutritional patterns of patients with NAFLD and the control group differ significantly. The obtained data may be used for diet modification in patients with NAFLD.

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**Keywords:** NAFLD, food pattern, Russia

## COVID-19 and drug-induced liver injury during treatment with tocilizumab

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**Aims:** High levels of interleukin-6 (IL-6) associated with cytokine storm (systemic inflammatory syndrome characterized by multiple organ dysfunction) in the setting of Corona Virus Disease-19 (COVID-19) evoked the use of tocilizumab (IL-6 receptor antagonist). Numerous clinical studies have shown very good improvements both, in laboratory tests and in clinical conditions, in patients with COVID-19 treated with tocilizumab. Prior to use in patients with COVID-19, tocilizumab led to acute liver injury only in extremely rare cases. With this case report we want to show the serious hepatotoxicity of tocilizumab that can occur in patients with COVID-19.

**Methods:** We describe a patient with COVID-19-induced cytokine storm who developed drug-induced liver injury (DILI) associated with the use of tocilizumab.

**Results**: A 52-year-old man with COVID-19 developed a cytokine storm for which he was treated with 2 doses of tocilizumab with a 12-hour break between doses. 24 hours after tocilizumab administration, he developed acute liver injury with serum transaminase levels increased 40-fold. Ten days after DILI associated with the use of tocilizumab (proven with Roussel Uclaf Causality Assessment Method/Council for International Organizations of Medical Sciences – CIOMS/RUCAM method) transamination levels returned to normal. Tocilizumab had a positive effect on clinical and laboratory parameters in cytokine storm, and levels of CRP, D-dimer and IL-6 almost became normal.

**Conclusion**: Due to the increasing use of tocilizumab for the treatment of COVID-19 during a pandemic, we would like to warn of its rare but sometimes serious hepatotoxicity. This is the first reported case of DILI caused by tocilizumab in a COVID-19 patient. The entire paper was published in Liver International 2020;40:1901–1905.

**Keywords:** COVID-19, tocilizumab, drug-induced liver injury, hepatotoxicity, SARS-CoV-2

## Results of the international multicenter study "SUCCESS": Data from Kazakhstan

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Components of metabolic syndrome (MS) especially cardiovascular disease (CVD) are strongly associated with Non-alcoholic fatty liver disease (NAFLD) and often determine the overall prognosis and mortality in NAFLD patients.

**The aim** of this study was to evaluate efficacy of a pleiotropic molecule – ursodeoxycholic acid (UDCA) – on liver disease, atherogenesis and CV risk in NAFLD.

**Methods:** 47 patients with NAFLD diagnosed by ultrasound and fatty liver index (FLI) were included in the open label non-controlled 6-month study of UDCA (15 mg/kg/day). Functional liver tests (FLT), lipid profile, FLI, NFS and FIB-4 indexes, as well as thickness of intima media complex (TIMC) and atherosclerotic cardiovascular disease (ASCVD) risk were estimated before and after treatment.

**Results:** Initially, 68% of patients met the MS criteria (increased waist circumference (WC) – in 88% of men and 100% of women; T2 DM / impaired glucose – in 36.5%; arterial hypertension – in 15%; increased triglycerides (TG) – in 68%; decreased HDL – in 35% of men and 33% of women). ALT was increased in 24%, and 32% of patients had intermediate fibrosis according NFS. TIMC exceeded the corresponding norm in 43%, and ASCVD risks (10-year and lifetime) were more than optimal values in all the patients ($p>0.05$). At the end of UDCA treatment, the BMI and WC reduction as well as decrease of ALT (35.1±18.8 vs 25.3±15.1 U/l; $p=0.001$), AST (23.7±7.8 vs 20.6±6.41 U/l; $p=0.032$), GGT (42.5± 25.9 vs 30.1±17,6; $p=0.001$), FLI (81.5±11.5 vs 72.3±15.5; $p=0.0001$), NFS (-1.921±1.200 vs -2.315±1.278; $p=0.004$) were documented. In addition, LDL downward and TG upward trends were noted.

**Conclusions:** 6-month course of UDCA (15 mg/kg/day) had positive impact on FLT and validated indexes (FLI and NFS) in patients with NAFLD and MS.

**Keywords:** NAFLD, Metabolic syndrome, Cardiovascular disease, Ursodeoxyholic acid

## Usefulness of Leucocyte Ratios in Predicting In-Hospital Mortality of Patients with Decompensated Chronic Liver Disease – Experience from a Tertiary Care Referral Center

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**Background:** Different leucocyte ratios like Neutrophil to Lymphocyte Ratio (NLR), Monocyte to Lymphocyte Ratio (MLR) and Neutrophil to Monocyte Ratio (NMR) have been used as markers of inflammation in various conditions. In recent times, these ratios are being explored as markers for predicting mortality in patients with Decompensated Chronic Liver Disease (DCLD).

**Aim:** To demonstrate the usefulness of Leucocyte ratios as biomarkers for mortality prediction in Decompensated CLD.

**Methods:** A retrospective analysis of Decompensated CLD patients managed at our center from January 2019 – June 2021 was performed. Besides demographic and etiologic information, leucocyte ratios were calculated from the available admission investigations and comparison was done between those who survived to hospital discharge (survivors) and those who did not (non survivors).

**Results:** A total of 103 patients (mean age 51.2±9.7, 86.4% males) were included in the final analysis. Most common etiology of CLD was alcohol (67.9%), followed by Non-Alcoholic Steato-Hepatitis (NASH-13.6%) and chronic hepatitis b (CHB-11.7%). Ninety (87.4%) had some grade of ascites and encephalopathy was seen in 41 patients (39.8%). 29.1% (30) had Acute-on-Chronic Liver Failure as per the APASL definition. The in-hospital mortality of the cohort was 39.8% (41) and it was significantly higher in those who had ACLF (60% vs 31.5%; p=0.007). Median NLR (10.6 vs 4; p<0.001), NMR (20.6 vs 11.5; p<0.001) and MELD score (29 vs 22; p<0.001), but not MLR (0.5 vs 0.3; p=0.58) were significantly elevated in non-survivors compared to survivors. On logistic regression, MELD score>32 (OR-3.1, 95%CI:1.04-9.1) and NLR>7 (OR-8.5, 95%CI:3.04-23.9) were significantly associated with in-hospital mortality.

**Conclusions:** Leucocyte ratios, being simple and easily available, have a great potential to be used as biomarkers in decompensated CLD patients for mortality predictions. Further large-scale prospective studies are needed to accurately identify the association and their utility in routine practice.

**Keywords:** Lymphocyte Ratio, Neutrophil to Lymphocyte Ratio (NLR), Monocyte to Lymphocyte Ratio (MLR), Neutrophil to Monocyte Ratio (NMR), Decompensated CLD

## Cure of HCV infection as a risk factor for obesity and metabolic syndrome

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**Aim**: The cure of chronic hepatitis C (HCV) is associated with decreased risk of liver complications in patients achieving virus clearance. Body weight gain is currently the only discussed negative consequence of HCV cure. We intended to evaluate changes in body weight and serum lipid levels in patients treated with direct acting antivirals (DAA).

**Methods**: We retrospectively evaluated the data of 101 patients treated with DAAs who achieved sustained virological response (SVR), 58 males and 43 females, average age 56.9 years, all infected with HCV genotype 1b. Seventy-three patients (72.3%) had compensated liver cirrhosis. We recorded the body weight and further clinical and laboratory data before treatment and 3 years after the end of therapy.

**Results**: The mean patients' weight before the treatment was 78.4±12.9 kg. Three years after treatment, the average body weight raised to 81.2 ± 13.9 kg. The weight gain after treatment was significant ($p < 0.01$) as assessed by paired t-test. Pre-treatment hypertension was present in 57 of 101 (56.4%) patients and hypercholesterolaemia in 23 of 101 (22.8%) patients, the parameters did not change 3 years after treatment. Type 2 diabetes mellitus was newly diagnosed in only one patient in our cohort. Regression of liver fibrosis assessed by transient liver elastography (Fibroscan®) was proved in all patients.

**Conclusion:** We demonstrated a significant weight gain in patients after successful HCV treatment but there was no significant increase in the frequency of hypertension, type 2 diabetes and hypercholesterolaemia. The body weight gain in HCV patients after achieving SVR needs to be further studied. Patients at risk of obesity should be identified and an appropriate dietary intervention should be suggested.

## Detecting advanced liver fibrosis in patients with different liver disorders using 2D Shear Wave Elastography

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**Introduction/Aim:** Clinical management of a wide range of end-stage liver diseases depends on the progression of liver fibrosis and cirrhosis. The gold-standard method to assess fibrosis is liver biopsy, but it is limited by its potential complications and invasiveness. Allowing real-time liver structure visualization and assessment of liver stiffness (LS), two-dimensional (2D) shear-wave elastography (SWE) is a non-invasive technique, integrated into ultrasound machines. The present study aimed to evaluate the feasibility and utility of 2D-SWE to diagnose patients with advanced liver fibrosis and cirrhosis of different etiologies.

**Material/Methods:** This was a retrospective, six-month period, observational study, including patients undergoing 2D-SWE in a tertiary Portuguese hospital, using Arrieta Hitachi Ultrasound for LS evaluation. Reliable LS results were defined by 3-10 valid measurements, acquired in a homogenous area, without blood vessels. Quality criteria were: IQR/M≤30% and VsN≥70%. To discriminate between different fibrosis stages, we used cut-off values according to EFSUMB guideline recommendation (F2≥7.1kPa, F3≥9kPa and F4 ≥11,5kPa).

**Results:** A total of 189 patients were included (60.3% male, mean age 51.2±13.629 years). The main etiologies were Hepatitis C infection (41.3%), non-alcoholic fatty liver disease (NAFLD) (22.2%) and Hepatitis B infection (19.6%). Most SWE results (94.2%) presented IQR/M≤30% and 119 SWE (63%) presented both quality criteria. Of the 119 valid SWE measures, most patients presented no/low hepatic fibrosis (67.3%), 13 (10.9%) presented moderate fibrosis and 26 (21.8%) presented advanced fibrosis/cirrhosis. The NAFLD etiology was found in 37.1% of patients with invalid SWE exams, being associated with inadequate quality criteria for SWE ($p<0.001$).

**Conclusion:** The performance of 2D-SWE is effective in identifying advanced fibrosis, in patients with chronic liver disease from most etiologies, being an effective, non-invasive diagnostic tool for long term management and therapeutic decision in hepatology consultation. In NAFLD patients, results must be interpreted with caution.

**Keywords:** liver fibrosis, elastography, cirrhosis, liver disease

## Survival and rebleeding in post-hepatitis cirrhosis compared to other cirrhosis after the first event of bleeding oesophageal varices

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**Introduction:** The aim of our study was to evaluate the impact of viral etiology on survival and hemorrhagic recurrence after the first variceal bleeding event and to assess the prognostic scores performances according to the cirrhosis etiology.

**Methods:** A retrospective comparative study was carried out on eighty-three patients presenting with a first event of bleeding oesophageal varices at Habib Thameur Hospital of Tunis from January 2014 to June 2021. The patients were allocated to 2 groups: Group1 'viral-hepatitis cirrhosis', Group2 'cirrhosis of another origin'. Primary outcomes were inpatients and 6-week mortality and inpatient rebleeding. We also recorded late recurrence and long-term survival. Patients were risk-stratified using AIMS65, Rockall, Child-Pugh, MELDNA, AIMS 65, blatchford, APACHE II and ALBI scores.

**Results:** Eighty-three patients were included in this study. The average age was 63.7 years. Thirty-eight percent (38%) of the patients had post hepatitis B or C virus cirrhosis. Viral cirrhosis was not associated with an increased risk of early or late recurrence (p=0.8 and 0.5 respectively). Viral cirrhosis was associated with early death (28% versus 11.7%, p=0.05). Log-rank analysis of survival curves between hepatitis-B or C cirrhosis and other cirrhosis showed significant difference in long-term survival (p=0.019). For the prediction of rebleeding, the AIMS65 score was superior than other scoring system in group 1 (AUC=0.8) and MELDNA was the greater score in group 2 (AUC=0.65). For the prediction of mortality, AIMS 65 was the best score in group 1 (AUC=0.8) and MELDNA was the best score in group 2 (AUC=0.72).

**Conclusion:** We conclude that variceal haemorrhage in hepatitis-B or C cirrhosis is a bad prognostic sign and is associated with reduced survival despite control of the variceal bleed. Moreover, the performance of prognostic scores in predicting mortality and hemorrhagic recurrence varies according to the etiology of cirrhosis

**Keywords:** Cirrhosis, Variceal bleeding, Viral Hepatitis

## New Technology “Fibroscan” in a Low-Income Country; experience in Hospital Roosevelt, Guatemala

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Historically, biopsy has been the method to determine fibrosis. Transient elastography is a method that transmits vibrations of moderate amplitude and low frequency (50Hz) through the liver by means of an ultrasound probe, which is then expressed in kPa, as a measure of fibrosis. CAP is a method of measuring steatosis. In November 2019, Roosevelt Hospital acquired this latest generation device, and it is at the service of society. This hospital is one of the two national reference hospital in Guatemala. It should be noted that it is the only public health unit that has this device. Guatemala has been listed in Low-Income country, so having this technology is helping to the majority of the population.

**Aims:** To determine the main results in the first months of using Fibroscan.

**Methods:** Descriptive, retrospective and cross-sectional study. Data from patients who have undergone fibroscan from November 2019 to January 2020 were reviewed. The numerical variables were analyzed in measures of central tendency and the categorical ones in frequencies and percentages.

**Results:** 71 fibroscan have been performed, the main indication is HCV, followed by NAFLD and HBV. The main findings were: 50% of the patients with HCV had F4 (advanced fibrosis) and 63.64 some degree of steatosis; HBV 66.67% F1 (non-significant fibrosis) and 41.67 steatosis; NAFLD 43% F0 (without fibrosis) and 43% S0. Average of numerical values: kPa 14.05, CAP 244.01, age 46.7, valid measurements 11.06, IQR 4.188 and IQR / med 13.239.

**Conclusions:** The indications to request fibroscan are HCV, HBV and non-alcoholic liver steatosis, among others. 25.3% of the patients had METAVIR values compatible with liver cirrhosis. 42% of HBV patients have steatosis, as well as 63.63% of participants with HCV. International standards of study validity are met.

**Keywords:** Liver cirrhosis, Liver cirrhosis, hepatitis c, hepatitis b, Fatty liver

## Whether dietary patterns differ in patients with non-alcoholic steatohepatitis and simple steatosis

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**Background**: Little is known whether different dietary patterns play role in pathogenesis of different forms of non-alcoholic fatty liver disease.

**Aim**: To compare dietary patterns in patients with simple steatosis (SS) and non-alcoholic steatohepatitis (NASH).

**Methods**: The study (https://rscf.ru/contests/search-projects/19-76-30014), approved by LEC. Enrolled patients gave written informed consent. The data of 178 patients who met inclusion criteria of non-alcoholic fatty liver disease served as a source for the study. Subjects were divided into either NASH or SS group. Nutrilogic software was used for nutritional assessment. Dietary patterns assessed in accordance to "Healthy Eating Index" for the following groups of products: grains, fruits, vegetables, dairy products, meats, fats and confectioneries.

**Results**: There were 156 patients in the SS (mean age 56.5±12.3 y.o., mean BMI 40.58±14.9 kg/m$^2$) and 22 in NASH group (age 48.6±13.4 y.o., BMI 40.0±7.3 kg/m$^2$). No difference was found between NASH and SS groups in calories intake (Mean±SD: 2339±1067 in NASH vs 2499±959.6 kcal/day in SS group, p=0.548), consumption of fats (109.3±54.2 vs 114.1±46.67 g/day, p=0.89), proteins (106.6±51.0 vs 109.7±44.4 g/day, p=0.91) and carbohydrates (214.9±100.7 vs 251.3±121.5 g/day, p=0.21). However, dietary fibre intake was higher in those with SS (26.7±13.2 g/day vs 20.9±10.4 g/day in NASH, p=0.03). Analysis of the consumption of subgroups of foods revealed greater amounts of potatoes (0.14±0.08 vs 0.11±0.15, p=0.006), and lower – of onions (0.02±0.03 vs 0.07±0.1, p=0.006) and dairy butter (0.14±0.44 vs 0.15±0.21, p=0.009) intake in NASH compared to SS group. There was no other difference in the structure of vegetables (beans, root crops, leafy and other vegetables), and fats (animal fats, vegetable oils, margarines) consumption, as well as in the structure of other subgroups of foods.

**Conclusion:** Food patterns of patients with non-alcoholic steatohepatitis and simple steatosis differ significantly. The obtained data may be used for diet modification in patients with NAFLD.

**Keywords:** Non-alcoholic fatty liver disease, Non-alcoholic steatohepatitis, Dietary patterns

## Factors predicting treatment response, complications and hepatic decompensation after conventional trans-arterial chemoembolization (TACE) in patients with unresectable hepatocellular carcinoma (HCC)

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**Aims:** This study aims to assess the ability of various biochemical and radiological parameters to predict TACE response, decompensation post-TACE and other post-TACE complications.

**Methods:** 60 patients with intermediate-stage-HCC (BCLC stage-C) who underwent TACE were studied for up to 6 months, factors predicting TACE response, post TACE complications and decompensation were assessed.

**Results:** 60 patients (Male:Female=41:19; mean age=57.95±6.48) with unresectable HCC undergoing TACE were followed up to a 6-month period. 27(45%) patients achieved complete response (CR) whereas 14,12 and 7 patients had partial response, stable disease and progressive disease respectively; 4(6.67%) had post-embolization syndrome (PES);24(40%) decompensated during the 6-month follow-up period. There was significant difference in MELD scores, AFP, HAP score, ESR, NLR, PLR, serum albumin, cumulative tumour size, number of tumours and number of TACE sessions (P<0.05) between patients who had and hadn't achieved CR. On univariate analysis, AFP<100, MELD<10, HAP<1, NLR<2, albumin>3.5 mg/dl, tumour size<3 cm, single tumour were significantly associated with CR; HAP>1, bilirubin>2 mg/dl were significantly associated with PES, clinically significant portal hypertension (CSPH), CTP score>6, MELD>10, HAP>1, NLR>2, bilirubin>2, albumin<3.5, tumour size>3 cm, tumour number>1 were significantly associated with decompensation within 6 months post TACE. On multivariate analysis AFP (P=0.013, AUROC:0.973, 95% CI:0.79-1.00), HAP<1(P=<0.001, AUROC:0.818, 95% CI:0.708-0.928), number of TACE sessions (P=<0.001) were significant predictors of response to TACE; HAP>1 (P=0.016, AUROC:0.802, 95% CI:0.681-0.923), albumin<3.5 mg/dl (P<0.001; AUROC:0.943, 95%CI:0.1-0.168) and multilobar tumour involvement(P=0.041) were significant predictors of decompensation within 6 months post-TACE. CSPH (P=.038), bilirubin>2 mg/dl (P=0.016; AUROC:0.953, 95%CI:0.756-1), multilobar tumour involvement (P:0.041) were significant predictors of post-TACE complications including PES.

**Conclusion:** AFP<100, MELD<10, more number of TACE sessions were significantly associated with CR; patients with HAP>1, baseline Sr. Albumin<3.5 mg/dl and multilobar tumour involvement are likelier to decompensate post TACE. Patients with CSPH, Sr.Bilirubin>2 mg/dl and multilobar disease are likelier to develop post-TACE complications.

**Keywords:** TACE, HCC

## PANCREAS

### Mean Platelet Volume as a Predictor of Severity of Biliary Acute Pancreatitis

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**Aims:** Mean platelet volume (MPV) is an index of platelet activation and its role in many inflammatory conditions has been studied. Relationship of MPV with acute pancreatitis (AP) remains partially understood with many conflicting reports. The objective of this study was to assess whether MPV would be useful in predicting disease severity of biliary AP.

**Methods:** A total of 77 consecutive patients (male/female: 31/46) of biliary AP presenting to a tertiary care hospital from January 2018 to December 2020, were included in this study. Patients with pre-existing chronic pancreatitis and a previous history of AP were excluded. Demographic details, hematological parameters and serum amylase were recorded on the first day of hospital admission. Severity of AP was classified according to the 2012 revised Atlanta criteria. Patients with persistent organ failure of > 48 h were assigned to the severe AP group and all others were included in the non-severe group.

**Results:** There were 22 patients in the severe AP group and 55 patients in the non-severe AP group. MPV was significantly lower in the severe AP group (8.60 fL ± 0.10) as compared to the non-severe group (9.29 fL ± 0.10) (P = 0.008). Using a cut-off value of 8.95 fL, the overall accuracy of MPV for predicting severe AP (AUC: 0.701) had a sensitivity and specificity of 77.3 % and 63.6 %, respectively.

**Conclusion:** This study shows that MPV can be useful as a biomarker, at no additional cost, for predicting disease severity in patients of biliary acute pancreatitis on the first day of hospital admission.

**Keywords:** mean platelet volume, biliary acute pancreatitis, persistent organ failure

## A Rare Complication of Acute Pancreatitis: A Perforated Cecum

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An isolated cecal perforation is a rare complication of acute pancreatitis and early diagnosis and investigation is imperative. We present a 34-year-old female with a history of chronic back pain due to L5-S1 disc herniation with severe central canal stenosis who presented to the hospital with radiating, epigastric abdominal pain ongoing since the day prior to admission. She works as a bartender, and she reports daily alcohol, marijuana, and tobacco consumption. Initial imaging of the abdomen indicated a moderate diffuse enlargement of the pancreas with hazy peripancreatic inflammatory straining as well as fluid within the lesser sac, left paracolic gutter and pelvic cul-de-sac. There were also several mildly dilated and fluid-filled loops of small intestine present in the region of the proximal to mid jejunum.

The patient was treated for alcoholic pancreatitis, however, she reported worsening abdominal pain, tenderness, and distention two days into her hospitalization. She was empirically started on antibiotics and repeat imaging indicated an increasing amount of hypodense free intraperitoneal fluid scattered in the abdomen. She was emergently taken for an exploratory laparotomy with a Hartman's procedure, small bowel decompression, right hemicolectomy and ileostomy. Additionally, she was found to have intra-abdominal/pelvic abscesses as well as a dilated small and large bowel. Following the procedure, the patient was admitted to the intensive care unit for septic shock and severe ARDS.

Our case report showcases a rare complication of non-necrotizing pancreatitis. In a previously healthy individual, a cecal perforation should indicate suspicion for a distal colonic obstruction possibly secondary to malignancy. The associated high mortality indicates the paramount need for early recognition and surgical intervention. Along with this, a low threshold for repeat imaging must be considered in any patient who is rapidly deteriorating from acute pancreatitis and with worsening abdominal signs.

## OTHERS

### Novel treatment of COVID-19: Evaluation of Sofosbuvir and Daklatasvir combo – Single arm study

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**Background & Aims:** The coronavirus disease 2019 (COVID-19) pandemic is an ongoing global health crisis caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Intervening early in the disease course by antivirals can delay progression and improve clinical outcomes. Since Direct-acting antivirals (DAAs) changed the entire landscape of hepatitis C (HCV) treatment, there has been considerable interest with these DAAs, such as sofosbuvir and daclatasvir, as new repurposed options in COVID-19 therapeutics. This study is carried out to determine whether sofosbuvir/daclatasvir-based regimens improve clinical outcomes of patients with moderate or severe COVID-19.

**Methods:** This was a prospective study including patients with PCR- confirmed COVID-19, that were treated with sofosbuvir and Daklatasvir- based regimen for 14 days.

**Results:** Demographic data of the included 54 patients: Male (57%), female (43%), age <50 years (48%), > 50 years (52%), smoking (9%), diabetes mellitus (9%) and hypertension in 28% of patients. Clinical presentation of COVID-19: Fever (87%), cough (97%), dyspnea (70%), chest pain (61%), sore throat (53%), diarrhea (50%), mood changes (43%), muscle pain (87%), oxygen saturation median (93.5 +/- 5.5 %), and CT chest changes indicating COVID-19 was received in (55%) of patients. Laboratory data: PCR for Covid-19 was positive in (100%), CRP was positive in (87%).

**Outcome:** Complete recovery was observed in 100%, and none of the patients progressed to severe stage. Conclusions: Sofosbuvir/daclatasvir- based regimen is highly effective and safe in curing patients with Covid-19, preventing progression to severe stage as well as in decreasing mortality.

**Keywords:** Sofosbuvir, Daklatasvir, treatment, Covid 19

## Vomiting and nausea in celiac disease: prevalence, associated factors and response to a gluten-free diet

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**Aims:** To evaluate prevalence and associated factors of vomiting and nausea at celiac disease (CD) diagnosis and during gluten challenge, and response of nausea to a gluten-free diet (GFD).

**Methods:** Vomiting at diagnosis was assessed from patient records of 815 CD patients. Association of nausea with health-related quality of life and response to GFD were evaluated with questionnaires in one-year prospective study of 95 patients. Prevalence of vomiting and nausea during a three-day (10g/day) gluten challenge were assessed in 74 patients on clinical and serological remission.

**Results:** Twenty-eight (3%) patients presented with vomiting at diagnosis. They were less often screen-detected (4% vs 14%, p=0.002) and had more often abdominal pain (71% vs 49%, p=0.021), diarrhea (61% vs 40%, p=0.031), weight loss (36% vs 17%, p=0.019) and childhood symptoms (61% vs 33%, p=0.002) than those without vomiting. The groups were comparable in demographic data, family history for CD, serological and histological findings, HLA-genotype, other symptoms and comorbidities. In prospective study, more severe nausea correlated with reduced quality of life at CD diagnosis and both nausea and quality of life improved significantly on GFD. Gluten challenge provoked vomiting/nausea in 19% of patients. They consumed gluten-free oats less regularly than those without these symptoms (64% vs 92%, p=0.017), but did not differ in demographic data, clinical features at diagnosis, comorbidities, duration of GFD, BMI, or other symptoms or grain used during the challenge.

**Conclusion:** Vomiting was associated particularly with classical symptoms at diagnosis. Response of nausea to GFD and provocation of vomiting/nausea during gluten challenge support the specificity as symptoms of CD. Interestingly, regular use of gluten-free oats may increase the tolerance for these symptoms during acute gluten exposure.

**Keywords:** celiac disease, vomiting, nausea, gluten challenge

## Bleeding occurrence in patients with primary chronic anal fissures treated with local nifedipine in combination with lidocaine versus botulinum toxin A, versus anal dilation

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**Aims:** To compare the effect of local nifedipine with lidocaine (LNL) vs. injection therapy with botulinum toxin A (ITBTA) and anal dilation (AD), in treatment of bleeding in patients with primary chronic anal fissures (PCAF).

**Methods:** This controlled retrospective prospective longitudinal study covered a total of 94 patients, divided in 3 groups. The first was treated with LNL, the second with ITBTA and third using AD (30, 31 and 33 patients respectively). LNL therapy was conducted using ointment composed of nifedipine (0.3%) and lidocaine (1.5%), applied twice daily for 3 weeks. Clostridium botulinum toxin A-haemagglutination complex was used for ITBTA, dissolved with saline to concentration of 200 U/ml. The solution was applied to both sides of PCAF at dose of 40U. To minimize the risk of adverse effects, modified technique of AD was done. Three fingers of single hand were progressively introduced into the anal canal, followed by gradual lateral distraction in direction of 3 and 9 o'clock during 1 minute. The follow-up period was 12 weeks with a check-up at week 4.

**Results:** The median age of all participants was 46.6 ± 13.9 years (50 males vs. 44 females). Type of therapy had a significant effect on bleeding at week 4 ($p = 0.00012$). Patients that still bled, treated with ITBTA were less common compared to AD, but more frequent than patients treated with LNCL ($p = 0.007$). AD group bled more often than LNCL group ($p = 0.00003$). All three had a different time of bleeding disappearance until week 12 ($p < 0.0001$). The average time to termination of bleeding was 4.2 ± 1.5 weeks in LNCL group (shortest time); 4.7 ± 2.5 in ITBTA and 8.7 ± 2.05 weeks in AD group.

**Conclusion:** LNCL therapy is superior to ITBTA and AD in reducing bleeding in patients with PCAF.

**Keywords:** Primary chronic anal fissures, Local nifedipine in combination with lidocaine, Botulinum toxin A, Anal dilation

## Acute abdomen- how radiologist can help?

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**Background:** Intestinal obstruction accounts for approx. 15% of all emergency visits for acute abdominal pain. Obstruction may sometimes accompany complicated appendicitis. In rare cases, the clinical image of appendicitis may be equivocal, and pose diagnostic difficulties.

**Case report:** A 6-year-old boy visited a General Practitioner due to diarrhea, abdominal pain with moderate fever up to 39° C for 2 days. Treatment was initiated, however the recurrence of abdominal pain was observed. The child was admitted to the Emergency Department where physical examination revealed abdominal guarding, and visible, palpable painful intestinal loops in the left iliac and hypogastric regions – 'acute abdomen'. Single air-fluid levels indicative of bowel obstruction were detected on X-ray. Ultrasound revealed distended, fluid-filled intestinal loops with diminished motility. The intestinal wall was swollen. Laboratory tests indicated increased inflammatory indices. Contrast-enhanced computed tomography examination of abdominal cavity and lesser pelvis showed intestinal dilation. The loops were filled with liquid content with numerous collections of gas. The patient was qualified for laparotomy. An intraoperative diagnosis of perforated gangrenous appendicitis with autoamputation was made. In addition, numerous interloop and pelvic abscesses, excessive adhesions, signs of small intestine micro-perforation and diffuse peritonitis were found. The patient's condition and laboratory parameters significantly improved during the following days of hospitalization.

**Conclusion:** Appendicitis may result in numerous complications and a significant deterioration of the patient's health. Despite the implementation of multidirectional, specialized diagnostics in the case of acute abdomen, in everyday practice we still encounter situations where the final diagnosis is made intraoperatively only.

**Keywords:** chronic appendicitis, acute abdomen, diagnostic imaging

## The value of doppler ultrasound in patients with splenic artery aneurysms before and after embolization

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**Aims:** The incidence of visceral aneurysms in the population is estimated at 0.1-2% and they are most common located in the splenic artery. They are four times less often in men than in women. The aim of the study was to demonstrate the value of doppler ultrasound in patients with splenic artery aneurysms before and after embolization.

**Methods:** The study involved a group of 30 patients, including 21 women who were diagnosed in ultrasound examination with a splenic artery aneurysm. In all patients, the ultrasound examination was performed with the Logiq 7 GE machine using a 3.5 MHz probe. In the group of patients with aneurysms with diameter of 18-22, embolization was performed and the controlled ultrasound examination was done six months after procedure.

**Results:** A single aneurysm of the splenic artery was diagnosed in all 30 patients. In the group of 21 aneurysms located in the distal part of the artery in splenic hilum 8 reached a diameter of 18-22 mm, while the remaining 13 aneurysms diameter of 11-17 mm. The remaining 9 aneurysms were located in the middle part of the splenic artery and reached a diameter of 12-16 mm. 8 aneurysms with a diameter of 18-22 mm, 7 of them were diagnosed in women of childbearing age and these patients were qualified for embolization. Controlled ultrasound examination performed six months after procedure confirmed the effectiveness of the embolization and total exclusion of the aneurysms from the circulation.

**Conclusions:** The ultrasound examination allows the unequivocal diagnosis of splenic aneurysms located in the distal part of the artery and qualification for endovascular treatment. Ultrasound examination is the method of choice in monitoring patients before and after embolization of splenic aneurysms.

**Keywords:** splenic artery aneurysms, embolization, ultrasound, doppler

## Increased TRPV1 gene expression in the tissues of Barrett's esophagus and esophageal adenocarcinoma

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**Aim:** Gastroesophageal reflux disease (GERD) occurs when the stomach contents return back to the esophagus and causes symptoms and/or complications such as reflux esophagitis (RE), Barrett's esophagus (BE) or esophageal adenocarcinoma (EAC). The transient receptor potential vanilloid subtype 1 (TRPV1) is main acid receptor, whose up-regulation plays an important role in the development of distal esophageal inflammation and reflux symptoms. The aim of this study was to analyze two functional single nucleotide polymorphisms (SNPs) in *TRPV1* gene and its expression in esophageal tissue in patients with GERD.

**Methods:** Two SNPs (C/G rs222747; C/T rs8065080) in *TRPV1* gene were determined in the 325 patients with GERD (142 with RE; 61 with BE; 22 with EAC) and 101 healthy controls. The *TRPV1* mRNA expression was analyzed in pathological and healthy esophageal tissues of 10 patients with RE, 8 with BE and 7 with EAC. Both types of experiments were based on TaqMan® polymerase chain reaction method. For statistical evaluation was used the Statistica v13.2 software.

**Results:** The allele, genotype, haplogenotype or haplotype frequencies of study SNPs between patients with GERD or RE/BE/EAC separately and healthy controls were similar ($p>0.05$). The higher mRNA *TRPV1* expression was found in the tissues of BE ($p=0.017$) and EAC ($p=0.018$) compared to healthy tissues.

**Conclusion:** There was found increased mRNA *TRPV1* expression in the pathological esophageal tissues of patients with BE or EAC who might benefit with pharmacological modulation of TRPV1 receptor.

**Acknowledgments:** This study was supported by Ministry of Health of the Czech Republic, grant nr. NU20-03-00126.

**Keywords:** gastroesophageal reflux disease, TRPV1, gene expression, single nucleotide polymorphisms

## First case of peritonitis and acute pancreatitis due to Toxocara infection in a previously healthy 5-year-old boy

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**Aims:** To present the case of Toxocara-related peritonitis followed by acute pancreatitis.

**Methods/Results:** We present a 5-year-old boy presenting with 12-hours-history of fever and anorexia. The boy belonged to the ethnic minority of Roma, he lived under conditions of poverty and poor sanitation and had contact with stray cats and dogs. Past medical history revealed persistent eosinophilia for the past 6 months (Eos2.560/ml). He complained of abdominal pain and presented non-bloody diarrhea. Laboratory investigation showed elevated CRP:111mg/l. Stool virus antigen test and culture were negative. Abdomen CT, revealed findings consistent with inflammation of appendix. The patient was treated with intravenous cefotaxime and metronidazole and underwent laparotomy. Intraoperatively, the abdominal cavity contained plenty of milky white peritoneal fluid, whereas the appendix was normal. Appendectomy was performed. The results of the peritoneal fluid cultures were negative. Four months later, the child presented with generalized abdominal pain. The patient was afebrile. Physical examination demonstrated abdominal tenderness. One month prior to admission, absolute eosinophil count was 1.460/ml and he was prescribed oral mebendazole once a day for 1 day and 1 dose repeated in 2 weeks, without a positive test for pinworms infection. Abdominal ultrasonography showed diffuse echogenicity of pancreas with peripancreatic effusion without dilation of both common bile duct and pancreatic duct. Laboratory investigation with elevated serum and urine amylase and serum lipase confirmed the diagnosis of acute pancreatitis. In order to find the cause further investigation was performed. Classes and subclasses of the immunoglobulins were normal, c-ANCA and p-ANCA were absent. Acylcarnitine profile analysis and urine organic acids test were normal. On the $6^{th}$ day, the eosinophil count increased to 877/ml. The persistence of eosinophilia raised the suspicion of toxocariasis. Toxocara ELISA was positive and the child treated with a 5-day course of oral mebendazole. The clinical course was favorable with complete clinical and laboratory resolution. The patient remains asymptomatic after a three-month follow-up period.

**Conclusions:** We highlight the need to rule out parasitic infections, and especially toxocariasis, in all patients with gastrointestinal symptoms and eosinophilia.

## Hyperplasic gastric polyps: about 63 cases

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**Aims:** Gastric hyperplasic polyps are the second most common subtype of gastric polyps. The identification of dysplasia is a rare situation but its frequency is diversly appreciated by literature, going from 1 to 20%. The attitude towards these polyps is not consensual and their management remains debatable.

The aim of this study was to evaluate the benefit of the systematic endoscopic resection in gastric hyperplastic polyps.

**Methods:** We conducted a retrospective study including all the patients who had an endoscopic resection of gastric polyps between 2008 and 2020. We evaluated the prevalence of gastric hyperplasic polyps as well as their endoscopic, histologic and evolutive characteristics.

**Results:** Seventy-three polyps were endoscopically resected in 50 patients. Sixty-three polyps were hyperplasic (86.3%), found in 40 patients. The mean age of patients with hyperplastic polyps was 62 years [19-86]. The sex ratio was 0.66 (M/F=16/24). The revealing symptoms were mainly epigastric pain (N=21) and anemia (n=9). The hyperplasic polyps were unique in 37 patients. The polyps' location was: antral (52%), fundic (34%), bifocal (14%). Most of the polyps were sessile (n=54). The average size was 8.3 mm [3-35mm]. An associated gastritis was found in 100% of the cases. Seven patients had a fundic atrophy. *Helicobacter pylori* was noted in 82% of the cases. Metaplasia lesions were found in 18 patients. An endocrine hyperplasia was found in 6 patients. No cases of associated neoplasia were found. Among all the resected polyps, only 2 had a low-grade dysplasia. The average follow-up duration of these patients was 33 months. Polyp recurrence was noted in 9 among them.

**Conclusion:** The prevalence of dysplasic lesions in gastric hyperplasic polyps was 2.7% in our series. This suggests the necessity of a systematic resection of all the hyperplastic polyps. The submucosal dissection should be privileged considering the high recurrence rate.

**Keywords:** gastric polyp, hyperplastic gastric polyp

## Peritoneal and ileocecal tuberculosis: about 146 cases

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**Aims:** Peritoneal and ileocecal localization represent the most common forms of digestive tract tuberculosis. Since Symptoms and signs of peritoneal and ileocecal tuberculosis are nonspecific, the diagnosis may be missed or delayed resulting in increased morbidity and mortality.

The aim of our study was to determine the clinical, the endoscopic and the radiological characteristics of peritoneal and ileocecal tuberculosis and to assess their course under treatment.

**Methods:** A retrospective study was conducted including all cases of peritoneal and ileocecal tuberculosis diagnosed over 21 years (2000–2021). Cases of peritoneal or ileocecal tuberculosis associated with active pulmonary tuberculosis were excluded.

**Results:** we collected 146 cases: 118 cases of peritoneal tuberculosis, 27 cases of ileocecal tuberculosis and one case of both peritoneal and ileocecal tuberculosis. Included patients (Men=66, Women=80, Mean age= 35 [12-75]) mostly presented with an abdominal pain (82%) or abdominal distension (76%). A complicated form was found in 12 patients (intestinal obstruction (n = 10) and perforation (n = 2)). The physical examination revealed an abdominal mass in 25 patients (17%), ascites in 36 patients (53%), peripheral lymphadenopathy in 16 patients (11%). Abdominal imaging visualized ascites (n = 70), gastrointestinal parietal thickening (n = 30) and hypoechoic mesenteric lymphadenopathy (n = 48). Colonoscopy showed cecal retraction (n = 12), ulcers (n = 15) and strictures (n = 3). Laparoscopic diagnosis (72 patients) revealed ascitic fluid and peritoneal thickening in 95% of cases. Biopsy samples revealed caseous granuloma in 58 patients (39.7%). Treatment was based on antitubercular drugs in all cases. 84% of patients responded well to medical treatment. 11 patients (7.53%) experienced side effects to antitubercular drugs.

**Conclusion:** Peritoneal and ileocecal tuberculosis should be suspected in an unusual gastrointestinal presentation, especially in high tuberculosis-endemic areas. However early diagnosis may be difficult due to the resemblance to other gastrointestinal pathologies such as Crohn's disease.

**Keywords:** tuberculosis, peritoneal tuberculosis, ileocecal tuberculosis

## Are biofeedback and tibial neuromodulation effective in treatment of functional defecatory disorders in patients with rectocele?

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**Aim:** To evaluate the efficacy of conservative treatment with tibial neuromodulation and biofeedback therapy in patients with obstructive defecation syndrome and rectocele.

**Methods**: Patients (females) with obstructive defecation syndrome and rectocele were enrolled. Clinical data, a specialized questionnaire for the assessment of severity of evacuatory function impairment, X-ray defecography, and high-resolution anorectal manometry were used to assess bowel evacuatory function impairment before and after treatment with biofeedback therapy and tibial neuromodulation. Non-parametric statistics was used for the analysis.

**Results:** Sixty females aged 48.2±13.4 y.o. were examined. Rectocele 1 grade found in 5% of them, 2 grade – 61.7%, 3 grade – 33.3%. Functional defecatory disorder of 1 type found in 68.3%, II – in 10%, III type-16.7% and IV – 5% participants. After treatment, mean evacuatory disorders' severity decreased form 11.4±3.7 to 8.7±3.7 points ($p<0.001$). Complete resolution of functional defecatory disorder reached in 36.7%, partial improvement (by clinical and manometric assessment) – in 43.9% participants.

**Conclusions**: Complex conservative treatment with the use of biofeedback therapy and tibial neuromodulation may be effective in significant number of patients with rectocele and functional defecatory disorders. Additional factors (like diet and physical therapy) should be considered to gain additional benefit in those with partial effect.

**Keywords:** high-resolution anorectal manometry, Functional defecatory disorders, Biofeedback therapy, Tibial neuromodulation, Rectocele

## Iron deficiency anemia in patients with gluten-dependent disorders on a gluten-free diet

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**Introduction:** Iron deficiency anemia (IDA) is the most common extraintestinal symptom of celiac disease (CD) in adults.

**Aims:** This paper investigates IDA parameters in general clinical and biochemical blood analysis in patients with gluten-dependent disorders on a gluten-free diet.

**Methods:** We recruited 38 adult patients with diagnosed CD or NCGS who were on a gluten-free diet. We used the multimodal integrated approach in a laboratory study and investigated the erythrocyte count, hemoglobin, ferritin, total iron-binding capacity (TIBC), iron, and blood transferrin levels.

**Results:** 13.16% of examined patients were diagnosed with IDA according to their hemoglobin levels. We found a hidden iron deficiency in 18.42% of the patients. In 23.08% of patients, the serum iron concentration was decreased, whereas we found the ferritin levels to be reduced in 31.58% of patients even though they were following a gluten-free diet for 6.5 (IQR 4-12) years. Eventually, the rate of all iron deficiency cases (including the hidden ones) twice exceeds the rate of IDA detected by hemoglobin analysis. Iron deficiency was more frequent in patients with CD than with NCGS (83.3% and 16.7%, respectively).

**Conclusion:** Despite following a gluten-free diet, patients with CD and NCGS are at high risk for the development of IDA. One side, isolated detection of decreased red blood cell levels are not informative. Contrariwise, isolated levels of iron serum are also insignificant. Thus, ferritin should be considered the most significant marker of IDA. It is essential to monitor this group of patients to identify hidden forms of nutritional deficiency.

**Keywords:** celiac disease, iron deficiency anemia, gluten-free diet

## Change of clinical practices after the introduction of endoscopic screening for gastric cancer in Japan

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**Aims:** Endoscopic screening for gastric cancer was introduced in 2016 based on a change of the national policy. Although the Japanese health insurance generally does not cover such examinations for asymptomatic persons, upper intestinal endoscopy has been performed regardless of symptoms in clinical settings. Since the introduction of endoscopic screening, the aim of endoscopic examinations needs to be clearly separated into those for patients with and without symptoms. Besides, *H. pylori* (HP) eradication might increase because atrophic gastritis can be easily diagnosed by endoscopy. The changes in clinical practice after the introduction of endoscopic screening were compared.

**Methods:** The numbers of endoscopic examinations, endoscopic submucosal dissection (ESD) and tests for HP infection using serum, stool, and breath were examined based on the Japanese national survey from 2008 to 2018.

**Results:** Before the introduction of endoscopic screening, the total number of endoscopic examinations increased from 2008 to 2013, particularly in outpatient clinics, and then flattened. Outpatient percentages decreased and remained around 10% since 2016. The total number of treatments for gastric cancer increased. ESD increased and accounted for over 50% of treatment since 2015. Although the number of endoscopic examinations has been stable, the number of ESDs has increased. The peak of HP infection testing increased rapidly in 2013, when HP eradication was covered by the national health insurance, but it decreased after that.

**Conclusions:** There has been no change in clinical practice except an increase of ESD after the introduction of endoscopic screening. The result might suggest that the detection of early cancer has increased with endoscopic screening. However, endoscopic examinations for asymptomatic peoples is still common in clinical setting. To avoid the overuse and inappropriate use of endoscopic examinations for asymptomatic persons in clinical practice, continuous observation is required.

**Keywords:** gastric cancer screening, endoscopy, *H. pylori* eradication, endoscopic submucosal dissection, clinical practice

## Lack of transcriptionally active Nrf2 and its implications to intestinal tissue development during gestation.

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**Aims:** We hypothesized that transcriptional activity of Nrf2 influences colon development during gestation that maintained in young animals and fade out with age.

**Methods:** We analyzed embryos collected from Nrf2 wild type and Nrf2 transcriptional knock-out (tKO) mice between the gestation age (E) of 14.5 to 20.5, as well as 4 days after birth. After euthanasia, embryos were fixed and mount in OCT. Additionally, the yolk suck was collected for DNA isolation and determination of sex-related gene Rbm31.

**Results:** Histological examination showed that lack of transcriptionally active Nrf2 leads to altered intestinal morphology such as reorganization of lamina propria and hypertrophy of epithelium observed from day E14.5, as well as irregular distribution and enlargement of goblet cells presented at day E15.5 and further. Additionally, immunohistochemical staining showed that expression of proliferative factors is disturbed in Nrf2-tKO embryos. The level of ki67 was elevated earlier in Nrf2-tKO embryos than in wild types (E14.5; $p<0.01$) and it was maintained at the same level until day E18.5. Meanwhile, the protein expression of Notch 1 was similar in both genotypes until E18.5 when it significantly dropped in the Nrf2-tKO embryos ($p=0.025$). Additionally, the morphological changes spotted during gestation such as altered colonic crypts organization, were present in four days old pups, where also goblet cells enlarging and higher number of alkaline compounds in epithelium and muscular layer was recorded. Of note the observed changes were not sex-dependent in embryos.

**Conclusion:** Transcriptional inactivation of Nrf2 may influence colon development during gestation and it may be associated with different level proliferative factors between E14.5 and E18.5 of gestation when intestinal tissue is developed. The observed changes are presented at birth, but they seem to be sex-independent at least until the weaning period.

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**Keywords:** Nrf2, intestine development, proliferation

## Doppler ultrasound as an important element of the assessment of vascular changes in patients with abdominal angina

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**Aims:** To assess the utility of doppler ultrasound (US) in the initial qualification of patients with clinical symptoms of abdominal angina for endovascular treatment and during postoperative follow-up (FU).

**Methods:** 30 patients (23 women, 7 men) with clinical symptoms of abdominal angina and suspected atherosclerotic etiology, were included in the study. Each patient was evaluated by US (B-mode, color and spectral doppler) and CT angiography (CTA), as a reference method. Based on the results of diagnostic imaging workup patients were referred for endovascular treatment. FU Doppler US was performed at 4-6 weeks after the intervention.

**Results:** Doppler US examination revealed significant stenoses of the visceral arteries in 27 patients; 15 superior mesenteric artery (SMA) and 12 co-existing celiac trunk and SMA narrowings. Doppler US failed to detect visceral stenoses in 3 cases (1 SMA and 2 celiac trunk and SMA stenoses), for which CTA indicated significant stenosis. Each of these patients underwent endovascular treatment (angioplasty with/without stenting). Follow-up Doppler US were performed at 4-6 weeks after intervention and confirmed undisturbed visceral blood flow in 27 patients; 3 patients required CTA due to failure to visualize visceral arteries.

**Conclusion:** Doppler ultrasound evaluation constitutes a valuable alternative for CTA both in primary diagnostics and follow-up of patients with abdominal angina. Based on the study results, Doppler US is characterized by high diagnostic efficacy, and CTA should be required only in individual cases.

**Keywords:** abdominal angina, Doppler ultrasound

## The effect of age, sex and genetics on the clinical features of celiac disease

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**Aims:** The possible associations between clinical outcomes and age, sex and genotype in celiac disease are poorly defined. We investigated these issues in a large cohort of patients.

**Methods:** Medical data of 1800 patients of all ages were collected. HLA-genotype was analysed from a subgroup of 960 patients. For the comparisons, age at diagnosis was classified to <3, 4-11, 12-19, 20–39, 40–59 and >60 years and HLA risk to high (DQ2.5/DQ2.5 or DQ2.5/DQ2.2) and intermediate. Only age, sex and HLA adjusted values are presented.

**Results:** Median age of patients was 29.2 years, 69% were women and 24% had high-risk HLA. Patients diagnosed in infancy had more often male gender (39% vs 17-37%), high-risk HLA (53% vs 19-26%), diarrhea (60% vs 32-42%), vomiting (22% vs 2-6%), poor growth (70% vs 31-32%) and total villous atrophy (37% vs 24-28%) and less often abdominal pain (35% vs 39-58%) than those diagnosed later. Median transglutaminase antibody levels decreased gradually by age from 120 U/l (<3-years) to 24 U/l (>60 years) (p<0.001). Females had more often abdominal pain (OR 1.58 [95% CI 1.27-1.97]), anemia (2.44 [1.54-3.88]) and thyroidal diseases (2.97 [1.78-4.95]) and less often diarrhea (0.73 [0.58-0.90]) and type 1 diabetes (0.45 [0.30-0.68]) than males. High-risk HLA was associated with anemia (1.69 [1.14-2.51]) and total villous atrophy (1.66 [1.11-2.47]).

**Conclusion:** Severe clinical and histological presentation was particularly common in infants with high-risk HLA, whereas sex associated more to the presence of anemia and comorbidities. The results may help to generate new pathogenic hypotheses.

**Keywords:** symptoms, HLA, genotype, age at diagnosis, sex

## Association of celiac disease with other autoimmune diseases in children

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**Aims:** The evaluation of the frequency of other autoimmune endocrine disorders in children diagnosed with celiac disease (CD).

**Methods:** Is a retrospective study that includes all patients with CD of our department. The data of 111 patients, 84 girls (76,1%) and 27 boys (23,9%), aged 2–17 years (median age 8,5 years) were examined.

**Results:** 12,9% of children had positive antithyroid antibodies, a percentage significantly higher than the corresponding (4,3%) reported in the Greek pediatric population. Type 1 diabetes mellitus (SD1) was found in 14,5%, also significantly higher than the prevalence of SD1 (7,04%) in the Greek population. Of the 111 patients 25 (22,5%) had been referred by a pediatric endocrinologist. All children with SD1 and positive anti-tTG IgA antibodies underwent endoscopy with Marsh classification. The percentage of biopsies with a Marsh score greater than IIIB was 42%, while 4,8% of these patients were diagnosed with eosinophilic gastroenteritis.

**Conclusions:** Celiac disease is an immune-mediated systemic disorder that occurs in genetically predisposed individuals and is associated with other endocrine autoimmune diseases. Systematic screening for CD in patients with SD1 and thyroid autoimmunity is indicated and clinically useful, for the early diagnosis and treatment, with gluten free diet, of these patients.

## Intestinal tuberculosis as a cause of gastrointestinal bleeding: Case report from a Kenyan hospital

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**Aims:** Tuberculosis, an infection caused by *Mycobacterium tuberculosis*, is the tenth leading cause of death worldwide, and the most common caused by a single infectious agent. 90% of the infections are in thirty high burden countries including Kenya. Extra pulmonary tuberculosis (ETB) can involve different abdominal organs. Enteric tuberculosis constitutes less than 5% of overall cases of ETB and mostly affects the ileocecal region.

**Methods:** We present a case report of an African woman who presented to a Kenyan hospital with lower gastrointestinal bleeding and was diagnosed with colonic tuberculosis after colonoscopy, biopsy and positive staining for tuberculous bacilli.

**Results:** A thirty-five-year-old female presented with hematochezia for five days. She also reported weight loss of ten kilograms over three months. Her medical history was significant for rheumatic heart disease and atrial fibrillation. Her regular medications included warfarin. The prothrombin time was prolonged and an International Normalized Ratio (INR) of 2.78. Serologic testing for HIV was negative. A computed tomography (CT) of the chest and abdomen demonstrated right lung consolidation, focal sub segmental consolidations in the left lung and lymph nodes in the small bowel mesentery. A colonoscopy revealed a distended ileocecal junction with ulcerations and polyps with aberrant vascular pattern extending to the hepatic flexure. Biopsies of the samples taken revealed necrotizing granulomas and staining was positive for acid fast bacilli. A diagnosis of intestinal tuberculosis was established and the patient was initiated on anti-tuberculosis therapy.

**Conclusions:** Intestinal tuberculosis should be suspected in patients living in tuberculosis endemic areas who present with gastrointestinal bleeding and weight loss. However, the diagnostic modalities of endoscopy and appropriate histologic staining, are not readily available in the high tuberculosis burden countries.

**Keywords:** tuberculosis, colon, Kenya, Africa, bleed

## Primary Rectal Malignant Melanoma: A Case Report from a Kenyan Hospital

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**Aims:** Rectal melanoma is a rare and aggressive malignancy that accounts for less than 0.05% of colorectal tumors and 1.3% of all melanomas. The anorectal region is the third most common site for non-cutaneous melanomas after head and neck region and the female genitourinary tract. The median age at diagnosis is the seventh decade and the incidence is higher in females than males. It is associated with dismal outcomes with reported overall five-year survival periods of 12 – 18 months. Due to the rarity of rectal melanoma, the prevalence of the malignancy in Sub-Saharan Africa is unknown.

**Methods:** This case illustrates a diagnosis of rectal melanoma after appropriate investigations in a woman presenting at a tertiary Kenyan hospital with lower gastrointestinal symptoms.

**Results:** A 58-year-old female presented with per rectal bleeding and episodic lower abdominal pain for three months. A colonoscopy was performed with findings of a polypoid mass. Biopsy of the mass showed large nuclei, prominent nucleoli with some having brown granular pigment in the cytoplasm. Immunohistochemistry showed positivity for melanoma markers HMB45, S100 and Vimentin. A diagnosis of malignant melanoma was made. BRAF (B-*raf* oncogene) mutation analysis was negative. Staging workup included a Magnetic Resonance Imaging (MRI) Pelvis and total body positron emission tomography (PET) scan. The MRI pelvis revealed a 1.7 cm x 1.2 cm lobulated enhancing mass arising from the lower rectum involving the internal sphincter and involving the left mesorectal lymph nodes. The PET CT scan for the whole body showed a metabolically active rectal tumor with regional spread. There was no evidence of distant metastasis. The patient was referred for abdominoperineal resection.

**Conclusion:** Rectal melanoma is a rare malignancy that can be diagnosed with appropriate histology and imaging.

**Keywords:** rectal, melanoma, Kenya, Africa, malignant

## Health Care Providers' knowledge, attitudes, and practices related to colorectal cancer screening in Durban, South Africa

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**Background**: Currently South Africa is prioritising greater control of non-communicable diseases however, South Africa does not have a national policy and guidelines that addresses Colorectal cancer (CRC) control. Our study explores current knowledge, attitudes, and practices on CRC screening among health providers in Durban public health facilities.

**Methods**: In 2021, 12 public health facilities were approved to participate in the study. Medical doctors and professional nurses are invited to participate in the study, until the end of December 2021 using a self-administered questionnaire. Descriptive analyses were conducted using Excel software version 2015.

**Results**: To date forty-one providers from six of the 12 facilities have participated in the study. Thirty-four (83%) were females and seven (17%) were males. Thirty-three (83%) were professional nurses and eight (20%) were medical doctors. Twenty-one (51%) had worked more than 10 years since graduation. Only one of the eight medical doctors has conducted CRC screening. However, participants were screening for breast, cervical and prostrate cancer. Thirty (73%) were familiar with different types of CRC screening methods with 63% that identified colonoscopy; 54% sigmoidoscopy and 44% identified gFBOT and 17% identified FIT as effective to reduce CRC mortality. However, 51% did not know the start age for CRC screening. Thirty-three (80%) were willingness to recommend CRC screening but twenty-eight (68%) were willing to perform CRC screening. Barriers affecting CRC screening identified included lack of SoPs or guidelines; lack of training; not common cancer in this area; and screening not part of cancer framework.

**Conclusion:** The study reveals that by adding CRC prevention and control component within the current National Cancer Framework and providing equipment, training and mentorship given the increasing burden of colorectal cancer in South Africa, will facilitate targeted CRC screening within the public primary health facilities in South Africa.

**Keywords:** Colorectal Cancer, Knowledge, Colonoscopy, Screening, South Africa

## Utilization of implantable ISFET pH sensors for personalized therapy of GERD

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Gastroesophageal reflux disease is a common disease with relatively high prevalence across the world. Although medication for GERD exists, not all patients respond to it. For these patients, the only possibility is either surgery or neurostimulation therapy. The development of non-intrusive pH monitoring systems is crucial for both evaluation of the objective efficacy of the treatment and to allow development of adaptive treatment based on continuous pH monitoring.

A commercially available chip-scale ISFET sensor was packaged together with on-chip gold reference electrode to form a “needle-style” probe. This probe was connected to miniature electronics which can measure the pH value from the probe and log it for several days in periodic intervals. The electronics is designed so it can be implanted endoscopically inside submucosa, with only the pH probe protruding to the esophagus.

The endoscopic implantation of the sensor electronics to the submucosa was successfully tested on a porcine esophagus model. The overall procedure time was less than 25 minutes. The sensor, together with the control electronics was successfully able to measure and log both absolute values of pH and have quick response time (several seconds to achieve 90% of the target value) inside esophagus.

The size of the presented solution for implantable pH sensing offers an advantage to today’s solutions as it neither requires implantation to the inside of the esophagus nor requires transnasal placement of sensor leads. Future research will concentrate on two aspects – design of a haemostatic-like clip with electrical connection to allow for permanent seal of the submucosal pocket and development of feedback loop controlled system for electrostimulation therapy of GERD.

**Keywords:** GERD, reflux, endoscopic, implantable, pH sensor

## HLA-typing could be utilized for targeting celiac disease re-screening of once seronegative family members: a long-term follow-up study

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**Aims:** Systematic serological screening of the close relatives of celiac disease patients is widely recommended. However, the need for and optimal timing of possible re-testing of once screening-negative cases remain unclear. We investigated these issues by inviting a large cohort of previously screened relatives for a long-term follow-up study.

**Methods**: Altogether 599 relatives (94% first-degree, 6% more distant) who received no diagnosis in a previous screening study carried out in 2006-2010 underwent inquiry about possible later diagnosis in clinical routine or screening with celiac disease autoantibodies. Besides the incidence, the possible impact of clinico-demographic parameters and HLA genotype on screening-positivity/later celiac disease diagnosis was assessed.

**Results**: Fifteen (2.5%) relatives (14 first-degree, one second-degree) had either a new screening-positivity (n=7) or were diagnosed with celiac disease (n=8) during the follow-up period, giving an annual incidence of 220/100,000 person years. The affected relatives carried more often the high-risk (DQ2.5/2.5 or 2.5/2.2) haplotype (38.5 vs. 7.6%, respectively, $p<0.001$) and were younger at initial screening (24.8 vs 40.5 years, $p=0.028$) compared with the non-affected relatives. There were no differences between the groups in degree of relationship, symptoms or presence of a coexisting celiac disease-associated condition.

**Conclusion**: Re-screening of at-risk family members resulted in a relatively low number of new cases even after a more than decade of follow-up. HLA-typing could be useful for targeting possible re-testing of the relatives.

**Keywords:** celiac disease, HLA, screening, relative

## Evaluation of efficacy and safety of a compound of micronized flavonoids with Vitamin C and extracts of Centella asiatica, Vaccinium myrtillus and Vitis vinifera, for the reduction of haemorrhoidal symptoms in patients with Grade II and III haemorrhoidal disease: a retrospective real life study

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**Aims**: One of the strategies fielded for hemorrhoidal disease is represented by the use of natural or synthetic phlebotonic flavonoid agents. Several evidences have highlighted how Quercetin reduces capillary permeability by increasing the resistance of the vascular walls and how Rutin and Vitamin C have anti-oxidant properties and Centella Asiatica has reparative properties towards the connective tissue. We carried out a retrospective study to evaluate the efficacy and safety of a compound consisting of micronized flavonoids in combination with Vitamin C and extracts of Centella asiatica, Vaccinium myrtillus and Vitis vinifera for grade II and III hemorrhoidal disease.

**Methods**: We analyzed data of 49 patients, over 18, following a free diet regimen, not on therapy with anti-hemorrhoid agents, treated with a compound of micronized diosmin, Centella asiatica, micronized hesperidin, Vitis vinifera, Vitamin C, Vaccinium myrtillus, micronized quercetin and micronized rutin for seven days and we evaluated hemorrhoid grade according to Goligher's scale together with anorectal symptoms both before treatment (T0) and after seven days of therapy (T7). Primary outcomes were reduction of at least one degree of hemorrhoids assessed by proctological examination and the safety of the compound. The secondary outcome was the reduction of anorectal symptoms assessed by questionnaires administered to patients.

**Results**: Primary outcome related to the reduction of hemorrhoidal grade was achieved by 89.8% of the patients ($p < 0.001$), and we observed no adverse events. We observed a significant reduction in all anorectal symptoms considered ($p < 0.05$). None of the clinical-demographic parameters collected (age, gender, level of exercise assessed by IPAQ questionnaire, number of hours spent in the bathroom, comorbidities, additional pharmacological therapies) was significantly associated with the achievement of the outcomes.

**Conclusion**: The compound analyzed in our retrospective study was effective and safe for patients with grade II and III hemorrhoidal disease.

**Keywords:** Hemorrhoidal disease, Flavonoids, Vaccinium myrtillus, Quercetin, Rutin

## Duodenoduodenal intussusception with invagination of the pancreatic head into the duodenum secondary to tubulovillous adenoma in the setting of duodenal malrotation: a case report

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**Aims:** Duodenoduodenal intussusception (DDI) is a rare entity due to the fixed position of the duodenum in the retroperitoneum. We report a rare case of documented DDI with invagination of the pancreatic head into the duodenum in a patient with a lead point (a tubulovillous adenoma) and duodenal malrotation with spontaneous resolution of the pancreatic invagination as noted intraoperatively.

**Methods:** Our patient is a 31-year-old male presenting with a 2-month history of vague epigastric pain, melena, anemia and weight loss.

**Results:** Esophagogastroduodenoscopy revealed a duodenal mass with adenomatous features. A triple contrast abdominal CT scan initially showed a duodenojejunal intussusception with invagination of the pancreatic head into the duodenum, causing dilatation of the pancreatic duct and the biliary tree. A follow-up MRI was then done which showed a duodenoduodenal intussusception, still with invagination of the pancreatic head. Patient underwent exploratory laparotomy where duodenal malrotation and intussusception at the second segment of the duodenum where the mass was also located with resolution of the pancreatic invagination were noted. Reduction of the intussusception and wedge resection of the mass was done. Patient was discharged with no complications.

**Conclusion:** Adult DDI is a rare entity that is challenging to diagnose due to its nonspecific symptoms and is possible in cases of malrotation and duodenal lesion which can act as lead point, such as in our patient. Hence, DDI should be considered in patients presenting with abdominal pain, bowel obstruction or bleeding.

**Keywords:** case report, duodenoduodenal intussusception

## Clinician-Reported Common Treatment Approaches of Laryngopharyngeal Reflux (LPR) and Clinician-Perceived Patient Satisfaction with Treatment: A Survey of ENT Specialists and Otorhinolaryngologists

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**Aims:** PPIs form the mainstay of LPR treatment, however, their efficacy remains poorly demonstrated. There is little information available regarding patient satisfaction with treatment practices. This survey aims to investigate clinician-reported treatment approaches and clinician-perceived patient satisfaction with current leading LPR treatment regimens.

**Methodology:** An online declarative survey was conducted by Ipsos among ENT specialists and otorhinolaryngologists in Germany (DE) and Turkey (TU) (n=100: DE = 50; TU=50). Panellists had 3–35 years' experience in their specialty, spent >60% of their professional time to clinical practice, and reported seeing at least 5 patients with symptoms or diagnosis of LPR per month. The survey was conducted using a market research methodology and is appropriate for collecting respondent-reported insights, however, it is not a validated epidemiological survey tool.

**Results:** Most clinicians (DE 94%; TU 98%) made intervention recommendations to most of their patients (of those who made a recommendation this was claimed to be to on average to 86% DE and 92% TU of their patients). However, prescribing practice varied. In DE, those recommending an intervention provided lifestyle advice to an average of 32% of their patients, monotherapy to 29%, combination therapy to 25%, and 13% were referred to another specialist. In TU, clinicians recommended lifestyle advice to on average 9% of their patients, combination therapy to 53%, monotherapy to 30%, and 8% were referred.

PPIs are the most widely recommended monotherapy (DE 92% of n=39 clinicians who recommended monotherapy; TU: 64% of n=34 clinicians who recommended monotherapy). However, greater diversity of options was reported in TU: 12% H2RA, 21% alginate, 3% antacid. Combination therapies varied considerably; the most common were PPI/antacid (15% DE of n=33 clinicians who recommended combinations; 33% TU of n=43 clinicians who recommended combinations), and PPI/alginate (28% TU of n=43 clinicians who recommended combinations).

48% of DE clinicians reported patient satisfaction with treatments (32% reported patient dissatisfaction) vs. 90% of TU clinicians reporting patient satisfaction (no dissatisfaction reported).

**Conclusions:**

- PPIs are the most prevalent options among mono- and combination therapy recommendations
- Combination therapy more common in TU, with greater variety of treatments vs. DE.
- More monotherapy options recommended in TU vs. DE; alginate and H2RA alternatives to PPI.
- Reported patient satisfaction varied: much higher patient satisfaction rates reported by TU clinicians.
- One third of DE ENTs surveyed reported patient dissatisfaction with treatment.

**Keywords:** Laryngopharyngeal Reflux, patient satisfaction, LPR, LPR treatment

## Clinician-Reported Prevalence of Laryngopharyngeal Reflux (LPR) in Germany and Turkey and Patient Pathways to Specialist Care: A Survey of ENT Specialists and Otorhinolaryngologists

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**Aims:** While increasingly common in ENT clinic, the prevalence of laryngopharyngeal reflux (LPR) remains elusive due to scant diagnostic criteria and overlap with other aetiologies. This survey aims to investigate clinician-reported incidence of LPR in secondary care and patient pathways to specialist care.

**Methods:** An online declarative survey was conducted by Ipsos among ENT specialists and otorhinolaryngologists in Germany (DE) and Turkey (TU) (n=100: DE = 50; TU=50). Panellists had 3–35 years' experience in their specialty, spent >60% of their professional time to clinical practice, and reported seeing at least 5 patients with symptoms or diagnosis of LPR in a typical month. The survey was conducted using a market research methodology and is appropriate for collecting respondent-reported insights, however, it is not a validated epidemiological survey tool.

**Results:** Mean perceived incidence of LPR in the adult population was 15% by physicians in DE (n=49 respondents; average 46 LPR patients seen monthly) and 20% in TU (n=46 respondents; average 52 LPR patients seen monthly). Different patient pathways into secondary care were reported in TU versus DE. In TU, clinicians reported being the first point of contact for most patients (62% patients direct to ENT); 26% were referrals from GP (12% other HCP referrals). In DE, most patients progressed to ENT consultations via GP recommendations (56%); 20% were seen directly by ENT (other referrals: <25%).

**Conclusions:** The results are in line with recent findings in the Chinese (5–14%), Greek (18.8%), US (26%) and British (30%) populations. The incidence of LPR in the general population warrants further investigation. Patient pathways into ENT care are disparate for patients with LPR symptoms in Turkey and Germany. Further investigation into patient education and clear pathways is warranted.

**Keywords:** Laryngopharyngeal Reflux, LPR, laryngeal conditions, GORD, Extraoesophageal Reflux

## The Role of White Blood Cell Count in Distinguishing Perforated Appendicitis from Acute Appendicitis in Children

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**Aims:** Our aim is to elucidate the role of white blood cell (WBC) count in distinguishing perforated appendicitis from acute appendicitis in children.

**Methods:** This retrospective study used medical record data of Atma Jaya Hospital, Jakarta, Indonesia from 2014-2019. The subjects were 36 children aged 3 to 17 years in which 52.8% and 47.2% had been diagnosed with acute appendicitis and perforated appendicitis, respectively. Data analysis was performed using the Independent t-test method with 95% confidence interval. Moreover, we evaluated Receiver Operating Characteristic (ROC) curve measuring cut-off value of WBC, sensitivity, and specificity. Youden index was applied to obtain proper cut-off values.

**Results:** WBC count for children with perforated appendicitis is significantly higher than acute appendicitis (14,262.94/$mm^3$ ± 4,199.14 vs 10,684.74/$mm^3$ ± 4,975.59, p=0.027). Area under the ROC curve (AUC) was 0.740. The optimal WBC count cut-off point for acute appendicitis was 10.205/$mm^3$ with 88,2% sensitivity and 57,9% specificity. Meanwhile, optimal WBC count cut-off point for perforated appendicitis was 12.650/$mm^3$ with 58,8% sensitivity and 73,7% specificity.

**Conclusion:** WBC count had the ability to distinguish perforated appendicitis from acute appendicitis in children.

**Keywords:** appendicitis, pediatric, perforation, white blood cell count

## The use of abdominal functional electrical stimulation as a therapeutic strategy for constipation in individuals with neurologic conditions: A prospective longitudinal analysis

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**Aim:** To investigate whether Abdominal Functional Electrical Stimulation (ABFES) improves constipation in individuals with neurological conditions over 6 weeks and the extent to which these results are maintained over 3 months.

**Methods:** Forty-four neurological patients with constipation (ROME IV criteria) participated in the study. A two-channel neuromuscular stimulator was used to elicit visible abdominal contractions of the anterior abdominal muscles. Stimulation parameters were set at 40Hz, 300µs pulse width and 40-50mA. Participants self-administered treatment at home for 30 minutes twice daily for six weeks. Self-determined titrated dose was used for a further three months. The Patient Assessment of Constipation Quality of Life (PACQoL) questionnaire, the primary outcome measure, was completed at baseline, six weeks and 3 months. The PACQoL was analysed separately across four subscales; physical, psychosocial, worries and concerns, and satisfaction (minimum clinical important difference (MCID) ≥0.5 points). Patient Assessment of Constipation Symptoms (PAC-SyM: MCID ≥0.6), laxative use and treatment dosage were also collected.

**Results:** All PACQoL subscales showed significant improvement (median Δ -1.67, $P<0.001$) between baseline and 6 weeks, with the improvements being maintained through to 3 months despite changes to participants ABFES dosage and laxative usage. Analysis of a subset of 6 non-MS patients showed significant improvement ($P<0.05$) in two subscales: physical and satisfaction. Similar to the PACQoL, a significant change (median Δ -1.26, $P<0.001$) was found between baseline and 6 weeks for the PAC-SYM, in a subset of participants (n=29) with complete data from all three time points. Analysis of the same subset of 6 non-MS patients also found significant improvements between baseline and 3 months ($P=0.028$).

**Conclusion:** This study found statistically significant and clinically meaningful reductions in self-reported constipation symptoms with ABFES, which were maintained over time. These findings are consistent with previous studies and suggest a large-scale, randomised controlled trial is required.

**Keywords:** Abdominal Functional Electrical Stimulation (ABFES), Neurological Conditions, Constipation

## Comparison of the adverse events and compliance to standard triple therapy in eradication of *H. pylori* with *Saccharomyces boulardii* addition

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**Introduction:** Wide spectrum of adverse events by *H. pylori* eradication may lead to therapy discontinuations and decrease of eradication rates. Adding probiotics, in particular *Saccharomyces boulardii*, to the eradication regimens is associated with lower frequency of adverse events and better compliance. According to the studies, *Saccharomyces boulardii* supplementation may also increase the effectiveness of the eradication therapy.

**Objective:** to prove lower adverse events frequency and better compliance after adding *Saccharomyces boulardii* to the eradication therapy.

**Methods:** We enrolled generally healthy participants aged 40-64. *H. pylori* positive patients (UBT) were then randomly allocated into four eradication subgroups – standard triple therapy (Amoxicillin 1000 mg x2, Clarithromycin 500 mg x2 and Esomeprazole 40 mg x2) 10 or 14 days with or without addition of 500 mg *Saccharomyces boulardii*. After 21-28 days data about adverse events and patients' compliance were registered.

**Results:** Overall, data from 265 patients was acquired. Adverse events were reported by 43.4% of respondents. The addition of *Saccharomyces boulardii* showed general tendency to lower frequency of adverse events (52.5% vs. 41.0% without and with probiotics respectively, OR 1.6), in particular nausea (15.4 % vs. 8.4%, OR 2.0) and significantly in diarrhoea in 14-day regimen (25.2% vs. 13.3%, OR 2.7, p=0.02). The compliance in groups with and without probiotics was equal.

**Conclusion:** Lower frequency of adverse events increases chance of positive outcome. The ongoing research on efficacy and resistome induction in subgroups will complement the results.

**Keywords:** *H. pylori*, Eradication, Probiotics, Cancer prevention, Adverse events

## A Randomized Controlled trial Comparing Levofloxacin, Dexlansprazole, Nitazoxanide and Doxycycline versus Triple Therapy for the Eradication of *Helicobacter pylori*

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**Aims:** *H. pylori* infection has become gradually more resistant to traditional first line treatment regimens because of evolving antibiotic resistance coupled with poor patient compliance. This study is designed to compare the novel four drug regime including Levofloxacin, Nitazoxanide, Doxycycline, and PPI i.e. dexlansoprazole (LOAD 10) with standard triple therapy including Amoxicillin, Clarithromycin and PPI i.e. dexlansprazole (LAC) for the treatment of *Helicobacter pylori* in treatment naïve patients.

**Materials and Method:** Patients with a diagnosis of *H. pylori* infection confirmed by using stool for *H. pylori* antigen, urea breath test and *H. pylori* serology and had not received any prior treatment for this infection were eligible for inclusion in this study. Patients were then randomly allocated in to LOAD group including Dexlansprazole 60 mg before breakfast levofloxacin 250 mg with breakfast Doxycycline 100 mg with dinner and Nitazoxanide 500 mg twice daily with meals for 10 days and LAC therapy for 14 days which included Dexlansprazole 60 mg before breakfast amoxicillin 1 g with breakfast and dinner and Clarithromycin 500 mg with breakfast and dinner. *H. pylori* eradication was confirmed by urea breath test at least 2 weeks after cessation of therapy.

**Results:** Intention to treat analysis did not reveal significant difference ($P<0.05$) in the respective eradication rates of the LOAD 10 therapy (28.57% (10/35)) compared with those receiving LAC therapy (25.7% (9/35)).

**Conclusions:** This study suggested that LAC and LOAD are similar with respect to treatment of *H. pylori* infection in our population. However other trials including larger population size must be conducted. Moreover due to emerging antibiotics resistance and failure of standard drug regimen antibiotics suspectability testing should be considered after the failure of first line treatment of *H. pylori* infection.

**Keywords:** *Helicobacter pylori*, Stool for *H. pylori* antigen, Urea breath test, *H pylori* serology, Antibiotics resistance

## Determining the bleeding point in obscure-overt gastrointestinal bleeding

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**Aims:** GI bleeding is a common hospital presentation. Upper GI bleeding in the UK ranges from 50-150 per 100,000 of the population per year while lower GI bleeding has an incidence of 33-87 per 100,000. However, approximately 5% of clinically evident gastrointestinal bleeding do not have a bleeding source identified on colonoscopy or gastroscopy. This can cause significant challenges in establishing a clear diagnosis and providing definitive management. This case illustrates the diagnostic challenge in a case of obscure-overt gastrointestinal bleeding and how this was overcome using anticoagulant provocation of bleeding to result in the successful management of a patient.

**Methods:** A 23-year-old female presented with hypotensive shock secondary to profuse rectal bleeding. Bidirectional endoscopic evaluation along with CT angiogram and VCE were unable to identify a source of bleeding and she was subsequently discharged. She had three subsequent admissions over the next four months where repeat investigations and additionally a Meckel's scan were unable to identify a definitive cause.

In order to facilitate diagnosis, with consent and under close inpatient observation, low molecular weight heparin was administered to provoke bleeding. Video capsule endoscopy finally identified a bleeding site in the terminal ileum.

**Results:** Laparoscopic exploration alongside push enteroscopy focussed on the area of bleeding seen on VCE showed superficial ulcers in the terminal ileum with three more proximal deep ileal ulcers with sloughy base. The affected bowel was excised and an ileocolic anastomosis made. Following operative intervention, the patient had an uneventful recovery and has remained well for the last two years. The cause of the ulceration remains unclear but to date there has been no evidence to clearly suggest inflammatory bowel disease.

**Conclusion:** This case illustrates that careful administration of anticoagulant provocation has the potential to unmask bleeding points in obscure gastrointestinal bleeds that evade conventional methods.

**Keywords:** gastrointestinal bleeding, video capsule endoscopy, anticoagulation, obscure-overt gastrointestinal bleeding

## Gastrointestinal complications of the COVID-19 treatment

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**Aim:** To analyze the frequency of gastrointestinal complications during COVID-19 treatment

Methods: We analyzed 324 medical histories of the patients with COVID-19 from April 2020 to June 2021 who were hospitalized in Central Clinical Hospital, Moscow, Russia.

**Results:** Elevation of the serum amylase levels were observed in 16.8% of patients, lipase in 15.4% of them, pancreatic alpha-amylase in 9.3%. Abdominal US showed structural changes of the pancreas in 3.5% of cases, which was confirmed by abdominal CT. Elevation of the AST and ALT was elevated in 19.2 and 35% consequently, 65% of the patients previously had liver steatosis.

**Conclusion:** Liver and pancreatic damage during COVID-19 treatment were common, most patients had the previous gastrointestinal disease.

**Keywords:** liver, pancreas, COVID-19

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