About Masimo

Masimo (NASDAQ: MASI) is a global leader in innovative noninvasive monitoring technologies. Our mission is to improve patient outcomes and reduce the cost of care. In 1995, the company debuted Masimo SET® through Motion and Low Perfusion™ pulse oximetry, which has been shown in multiple studies to significantly reduce false alarms and accurately monitor for true alarms. Masimo SET® has also been shown to help clinicians reduce severe retinopathy of prematurity in neonates, improve CCHD screening in newborns, and, when used for continuous monitoring with Masimo Patient SafetyNet™ in post-surgical wards, reduce rapid response activations and costs. Masimo SET® is estimated to be used on more than 100 million patients in leading hospitals and other healthcare settings around the world, and is the primary pulse oximetry at 17 of the top 20 hospitals listed in the 2017-18 U.S. News and World Report Best Hospitals Honor Roll. In 2005, Masimo introduced rainbow® Pulse CO-Oximetry technology, allowing noninvasive and continuous monitoring of blood constituents that previously could only be measured invasively, including total hemoglobin (SpHb®), oxygen content (SpOC™), carboxyhemoglobin (SpCO®), methemoglobin (SpMet®), Pleth Variability Index (PVi®), and more recently, Oxygen Reserve Index (ORi™), in addition to SpO2, pulse rate, and perfusion index (Pi). In 2014, Masimo introduced Root®, an intuitive patient monitoring and connectivity platform with the Masimo Open Connect™ (MOC-9™) interface, enabling other companies to augment Root with new features and measurement capabilities. Masimo is also taking an active leadership role in mHealth with products such as the Radius-7™ wearable patient monitor, iSpO2® pulse oximeter for smartphones, and the MightySat™ fingertip pulse oximeter. Additional information about Masimo and its products may be found at www.masimo.com. Published clinical studies on Masimo products can be found at www.masimo.com/cpub/clinical-evidence.htm.

ORi has not received FDA 510(k) clearance and is not available for sale in the United States.

*The use of the trademark Patient SafetyNet is under license from University HealthSystem Consortium.

How ZOLL technology helps

If a rescuer does not deliver compressions at an adequate depth, an audible and visual prompt to “Push Harder” will be initiated. Once proper depth is reached, it’s reinforced with a “Good Compressions” message. ZOLL’s professional defibrillators also display depth numerically.

The Guidelines now recommend a compression rate between 100 and 120 compressions per minute for sternal/manual CPR. A rate of at least 100 compressions per minute is necessary to achieve perfusion sufficient to support minimal circulation. A rate that is too fast often results in inadequate depth or leaning.

An easy-to-follow metronome beep helps rescuers achieve the correct rate. ZOLL’s professional defibrillators also display the rate numerically.

Real CPR Help® technology is built into the ZOLL defibrillator electrodes, which include a single-use soft sensor that gathers CPR data and transfers it to the defibrillator. There are no extra pieces and nothing to remember to add. Just place the electrodes and the Real CPR help is automatically enabled.

ZOLL’s patented See-Thru CPR® technology filters the CPR artifact so rescuers can see if an organized rhythm develops, thereby minimizing the duration of pauses.

The Guidelines emphasize that rescuers should not lean on the chest during compressions. The full upstroke, or release of a compression, is necessary to allow the heart to fill for the next compression. When rescuers fail to release the compression by not coming off the chest, pressure builds—making CPR ineffective.

ZOLL provides a release indicator that shows the rescuer whether he or she is fully releasing and doing so fast enough to support filling the heart for the next downward stroke. A “Release Fully” prompt reminds rescuers not to lean.
Herbal Supplements and Anaesthesia

For thousands of years herbal supplements have been used in medicine to maintain or improve the health. Nowadays natural medicine is very popular. The consumption of herbal products for self-treatment of any medical disorder is growing. The benefits of some of them are well known, but the variety of their side effects makes their use dangerous, especially when they are used in combination with other drugs. These plant products contain multiple compounds and have the same pharmacokinetics and pharmacodynamic principles as drug to drug interactions (1). Recent reports on anesthesia meeting (ARUD 2017) about uncontrolled bleeding during surgery and sudden death of victims consuming herbal supplements imposed the actualization of this problem (2).

In the anesthesia practice, the recognition of the use of herbal medicine is not routine and their adverse effects are unknown. Patients wrongly believe that the herbal supplements are always safe, thus avoiding to share prior to the operation this information with their family, doctors and the anesthesiologists. In the standard anesthetics protocols, the routine inquiries of the patient about their self-medications are missing. The contemporary knowledge of the influence of herbal supplements to other drugs and any possible interactions with medications used during anesthesia, highlights the crucial importance of asking patients about self-medication (3).

All herbal agents have potentially unexpected effects including sedation, toxicity or impairment of coagulation, that may be influenced by age, gender or current therapy (4, 5).

The goal of this short report is to remind my colleagues anesthesiologists that the herbal supplements are not placebo, and that they have many side effects. Most herbal drugs have good safety profiles, but they have unwanted influence on anesthetic and surgical practice, which must be taken into consideration. The list of the used herbal supplements is too long, but the presentation of several examples is sufficient to support these findings.

In 2003, Williamson EM reported about the hepatotoxic effects of kava or Echinacea when they were taken with other concurrent drugs (6). The popular herbs such as aloe leaf, guar gum and senna, are often used for slimming. Their main effect is laxative, producing many disorders and symptoms, often with severe consequences. Their main effect is laxative, producing many disorders and symptoms, often with severe consequences. In 2002, Williamson EM reported about the hepatotoxic effects of kava or echinacea when they were taken with other concurrent drugs (6). The popular herbs such as aloe leaf, guar gum and senna, are often used for slimming. Their main effect is laxative, producing many disorders and symptoms, often with severe consequences. In 2002, Williamson EM reported about the hepatotoxic effects of kava or echinacea when they were taken with other concurrent drugs (6). The popular herbs such as aloe leaf, guar gum and senna, are often used for slimming. 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ABSTRACT

Elderly patients (over 65 years old), who were randomized to unilateral spinal anesthesia (USA) in elderly patients with hyperbaric bupivacaine or levo-bupivacaine, were analyzed for differences in block characteristics, safety hemodynamic profile and other common side effects.

Background: Hemodynamic stability is desired outcome of any anesthetic technique.

Methods and Material: A study of 26 patients, average age 76.77±7.207, 18 female and 8 male, ASA 2 and 3, who underwent hernia repair (16%) were randomized in two intervention groups - Group I: USA with hyperbaric 5-10 mg Bupivacaine in 7% dextrose+20mcg Fentanyl and Group II: hyperbaric 5-10 mg L-Bupivacaine in 7% dextrose+20mcg Fentanyl. The two groups with comparable demographic characteristics had satisfactory surgical conditions with maximal Th10 sensory level for both groups; with a consecutive stable blood pressure, low rate of significant hypotension (1 case in group I and in group II), stable heart rate and low incidence of nausea, pruritus and post-dural puncture headache (PDPH). No Tachycardia, hypotension and hypertension can lead to perioperative myocardial infarction, stroke and other complications.

Results: Spinal anesthesia with low dose of hyperbaric bupivacaine is safe and reliable technique for elderly patients.

Conclusion: L-Bupivacaine and Levobupivacaine.

Key words: Elderly, hemodynamics, unilateral spinal anesthesia, USA.
were randomized in three groups, per 20 patients in each group. The sample size was calculated to position when the sensory level block was sufficient to perform the operation.

contraindication for any spinal anesthesia. A group of 60 patients meeting the inclusion criteria when Th10 was not reached, patients were turned supine after 20 minutes in lateral decubital position until Th10 sensory level was reached, and then turned supine. In rare cases spinal anesthesia in all eligible patients for spinal anesthesia, and their block characteristics as well.

was to test the difference in efficacy to produce clinically relevant unilateral spinal anesthesia in the dilated veins and the contralateral reflexive vasoconstriction. The proposed mechanism that explains the prevented hypotension is limited pooling of the blood dynamic profile, less hypotension and major cardiovascular and cerebrovascular perioperative events.

Our study aimed to explore the hemodynamic profile of USA with two different local anesthetics in elderly patients (7). The proposed mechanism that explains the prevented hypotension is limited pooling of the blood.

Spinal anesthesia’s the most feared side effect is hypotension, which in its own right is can lead to stroke (2). Elderly patients have increased mortality associated with anesthesia and hypertension can lead to perioperative myocardial infarction (1); furthermore hypotension in lateral decubital position received intrathecally 5-10 mg Bupivacaine 0.5% heavy (7% dextrose) between the groups), with study power of 80 and alpha error of 0.05 using Epi Info.

Group I Bupivacaine 0.5%, preparation Bupivacaine 0.5% heavy (commercial preparation) (5). Since its first use, this feared side effect has led to endless quests for the Holy Grail to major cardiovascular events. For that matter, neuroaxial anesthesia was proven to benefit the

Table

<table>
<thead>
<tr>
<th>Group</th>
<th>Bupivacaine 0.5% heavy (3% dextrose preparation) with Fentanyl 20μg</th>
<th>Bupivacaine 0.5% heavy (7% Dextrose) with Fentanyl 20μg</th>
<th>Fentanyl 20 mcg</th>
<th>Dextrose 35% 2 ml</th>
<th>Levo-Bupivacain 5 mg</th>
<th>Bupivacaine 0.5% heavy 10 mg</th>
<th>Levo-Bupivacaine 0.5% heavy (commercial preparation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
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<td>II</td>
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<td>III</td>
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</tbody>
</table>

Introduction
TABLE 1. Demographic characteristics and baseline data for the intervention groups

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Group I (n=16)</th>
<th>Group II (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean±SD, [range], years)</td>
<td>76.77±7.207, [65-90]</td>
<td>78.08±33.91, [70-90]</td>
</tr>
<tr>
<td>Sex (m:f), %</td>
<td>47:53</td>
<td>30:70</td>
</tr>
<tr>
<td>ASA class, I:II:III (%)</td>
<td>70:30</td>
<td>60:40</td>
</tr>
<tr>
<td>Hypertensive at baseline (MAP&gt;107mmHg), %</td>
<td>11.30±14.62, 107.87±15.44</td>
<td>9.50±1.29, 107.30±14.62</td>
</tr>
<tr>
<td>Intraoperative iv fluid volume, ml</td>
<td>1185.00±250.61</td>
<td>1068.7±29.44</td>
</tr>
<tr>
<td>Operation time, intraoperative fluid volume, ml</td>
<td>71.50±33.91</td>
<td>83.08±29.44</td>
</tr>
<tr>
<td>Hypertensive at baseline, %</td>
<td>0.51</td>
<td>0.58</td>
</tr>
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</tr>
</tbody>
</table>

Results:

Pes 3% loss at 2 minutes after spinal puncture was considered statistically significant.

ANOV A test for continuous non-normally distributed parameters, Chi-squared test for categorical data was used. The p-value is due to low sample size.
10 minutes and turning the patients supine after that to prepare for surgery, we found to be
0.846
84.90±17.375
84.47±16.703
MAP, 30 minutes [mean±SD], mmHg
The time to reach the peak sensory level was found to be similar in both groups and around
0.846
88.27±16.752
88.13±16.643
MAP, 15 minutes [mean±SD], mmHg
bupivacaine in such a small dose that is used during USA.
0.803
101.50±16.147
108.13±16.643
MAP, 5 minutes [mean±SD], mmHg
19). It is not expected that we can confirm the safety profile of levobupivacaine over racemic
0.523
108.13±16.643
106.87±15.445
MAP, 0 minutes [mean±SD], mmHg
isobaric than bupivacaine on body temperature, as theoretical, rather than clinically relevant (18,
0.470
110.30±14.622
110.30±14.622
MAP, baseline [mean±SD], mmHg
teristics, which leaves the statements of the less potency of the levo-bupivacaine, being more

Table 3. Block Characteristics

<table>
<thead>
<tr>
<th>Group</th>
<th>Brachial</th>
<th>C8</th>
<th>T1</th>
<th>Block characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>3:2</td>
<td>3:2</td>
<td>3:2</td>
<td></td>
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<tr>
<td>II</td>
<td>3:2</td>
<td>3:2</td>
<td>3:2</td>
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</table>

Discussion

The use of regional anesthesia and neuroaxial anesthesia has protective value in the elderly
patients and compared to general anesthesia (6); may lead to reduction of the perioperative
mortality rate associated with surgery and anesthesia increases with the increasing age. Cardiac
mortality in patients undergoing surgery with intermediate to high cardiac risk. (13). Maintaining
stable hemodynamic profile can be challenging with the standard spinal anesthesia (14, 15) and
as shown in Table 2, there is no statistically significant difference between the intervention
groups was Th10, with similar reach time of the Th10 sensory block in both groups (9.13±4.893
minutes and 8.70±5.355 minutes, group I and II, respectively).

Table 2. Hemodynamic Data

<table>
<thead>
<tr>
<th>Group</th>
<th>Time to regress to S2 (min-max), min</th>
<th>Time to reach Th10 (min-max), min</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>147.00±47.621</td>
<td>8.70±5.355</td>
</tr>
<tr>
<td>II</td>
<td>140.22±39.36</td>
<td>9.13±4.893</td>
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</table>

The hemodynamic data was comparable between the two intervention groups.
2. November 2017  |  19  |


13. Low dose of hyperbaric bupivacaine with fentanyl as adjuvant is safe and reliable anesthetic, commercially available, that is suitable for unilateral spinal anesthesia with no increased risk for cardiotoxicity due to low anesthetic dose used during unilateral spinal anesthesia. The waiting time can be safely shortened to the time to reach the desired sensory level. This study also supports turning the patient supine once the Th10 level is reached when performing a unilateral spinal block.


2. Rodgers A, Walker N, Schug S, et al. Reduction of postoperative mortality and morbidity with appropriate for the surgery to turn the patient to the operating position.

The pilot study included 24 patients treated at the Clinic for Gastroenterohepatology, Skopje, University Clinic of Anaesthesia, Reanimation and Intensive Care, Skopje, European Eye Hospital, Skopje, University Clinic for Cardiovascular Medicine, Skopje, and the University Clinic Ss. Naum Ohridski, Skopje. Among the different methods for nutritional assessment in hospital patients is a worldwide problem which leads to increased morbidity and mortality rate. Malnutrition in hospital patients is a worldwide problem which leads to increased morbidity and mortality rate.

The pilot study included 24 patients treated at the Clinic for Gastroenterohepatology, Skopje, University Clinic of Anaesthesia, Reanimation and Intensive Care, Skopje, European Eye Hospital, Skopje, University Clinic for Cardiovascular Medicine, Skopje, and the University Clinic Ss. Naum Ohridski, Skopje.

The objective of this study was to determine the validity of the measurement of the thickness of adductor pollicis muscle in correlation to other anthropometric measurements for nutritional assessment in critically ill patients.

The mean TAPM measured in mm was 16.67±2.16 in male and 13.00±1.73 in female patients for dominant hand, and 15.24±2.11 in male and 11.70±2.54 in female for non-dominant hand. The smallest mean TAPM was observed in patients younger than 45 years, and 16.83±2.38 in male and 13.00±1.73 in female for both hands. The mean TAPM in patients younger than 45 years was the highest for both hands: 17.30±2.47 in male and 15.67±2.55 in female. The mean TAPM in patients older than 45 years was the highest for both hands: 16.05±2.38 in male and 13.40±1.94 in female.

Results: The mean TAPM measured in mm was 16.67±2.16 in male and 13.00±1.73 in female patients for dominant hand, and 15.24±2.11 in male and 11.70±2.54 in female for non-dominant hand. The smallest mean TAPM was observed in patients younger than 45 years, and 16.83±2.38 in male and 13.00±1.73 in female for both hands. The mean TAPM in patients younger than 45 years was the highest for both hands: 17.30±2.47 in male and 15.67±2.55 in female. The mean TAPM in patients older than 45 years was the highest for both hands: 16.05±2.38 in male and 13.40±1.94 in female.

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Muscle mass showing some nutritional risk.

Introduction

The Body Mass Index (BMI) was calculated by dividing the weight (kg) by squared height (m²) and patients were not clinically able to walk. The pilot study included 24 patients treated at the Clinic for Anesthesiology, Reanimation and Intensive Care (CARIL) in the period from April to June 2017. The objective of the study was to determine the validity of the measurement of the TAPM.

Methods

The thickness of adductor pollicis muscle (TAPM) was measured at the spot where the MAC is measured. At 2 cm from the marked place the examiner, then note the measured value. The adipometer is marked and the measurement was carried out in the middle between them.

The study included all the patients from the unit who could be evaluated during the first 24 hours after admission to the hospital. The inclusion criteria were age older than 18 years, functional status before the injury, ability to understand and cooperate with the research protocol, and stable vital signs.

The inclusion criteria were: critically ill patient, nutritional assessment, thickness of adductor pollicis muscle (TAPM). This method presents a reliable method for nutritional status assessment and it correlates to the other anthropometric measurements for nutritional status assessment in critically ill patients. The measurement of the thickness of adductor pollicis muscle (TAPM) was measured in patients over 65 years of age both for dominant (14,43 ± 2,50) and non-dominant (14,47 ± 2,67). According to the subjective global assessment the mean TAPM was high (20,90 ± 2,30) in the group of patients classified as having low weight, was moderate (17,30 ± 2,71) in the group of patients classified as having normal weight and was low (14,50 ± 2,37) in the group of patients classified as having low weight.

Results

The correlation between the TAPM and other anthropometric measures showed a significant correlation with other anthropometric and inflammatory parameters. The method of measurement of TAPM was used to compare the results with the results of other anthropometric measurements, and the results showed a better correlation with the other anthropometric measurements.

Conclusion:

The new technique that enables an assessment of the muscle compartment and correlates with other anthropometric, biochemical and inflammatory parameters is the measurement of TAPM. The method of measurement of TAPM was used to compare the results with the results of other anthropometric measurements, and the results showed a better correlation with the other anthropometric measurements. The method of measurement of TAPM was used to compare the results with the results of other anthropometric measurements, and the results showed a better correlation with the other anthropometric measurements.
The TAPM was measured on the dominant and non-dominant side, with the patient seated, the arm flexed to approximately 90°, the forearm and the ventral side of the hand resting on the ipsilateral lower limb, the hand relaxed and using the adipometer with a continuous pressure of 10 g mm⁻². The muscle was clamped at the vertex of the imaginary triangle formed by thumb extension and index finger (picture 1). The procedure was done on the dominant and non-dominant hand three times, and the mean value was used as measurement of the TAPM.

Subjective Global Assessment
For the evaluation of the Subjective Global Assessment (SGA), family members answered questions focused on disease history, changes in weight, changes in nutritional intake, the presence of gastrointestinal symptomatology and functional capacity alteration. Physical examination was also included in order to determine the loss of subcutaneous fat, muscle tissue, the presence of sacral edema, edema of the ankle, and the presence of ascites. According to the obtained results the patients belong to three categories: well-nourished patients (SGA “A”), suspected/moderate malnutrition (SGA “B”), or severe malnutrition (SGA “C”). For statistical analysis, these data were transformed into dichotomous variables: no nutritional risk (nourished) and at nutritional risk (moderately malnourished and severely malnourished).

Statistical Analysis
All data were expressed as mean ± standard deviation and analyzed by SPSS 12.0 software. Group comparison was performed with t-test (student) and P < 0.05 was considered statistically significant. The one-way analysis of variance (ANOVA) was used to determine whether there are any statistically significant differences between the means of three or more independent (unrelated) groups.

Results
The mean value of TAPM in the male group of patients was significantly higher than the mean value in the female group, either for TAPM for the dominant hand or TAPM for the non-dominant hand (Table 1). Group Statistics

<table>
<thead>
<tr>
<th>Sex</th>
<th>N</th>
<th>Mean ± Std. Deviation</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAPM_DOMINANT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td>18</td>
<td>16.67 ± 2.169</td>
<td>0.002</td>
</tr>
<tr>
<td>FEMALE</td>
<td>5</td>
<td>13.00 ± 1.732</td>
<td></td>
</tr>
<tr>
<td>TAPM_NON-DOMINANT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td>18</td>
<td>15.24 ± 2.110</td>
<td>0.004</td>
</tr>
<tr>
<td>FEMALE</td>
<td>5</td>
<td>11.70 ± 2.540</td>
<td></td>
</tr>
</tbody>
</table>

In terms of age, in the study there were three age groups. In the first group the patients are up to 45 years old, in the second from 45 to 65 years, and in the third group the patients are over 65 years of age. Our results showed the highest mean values of TAPM in the group of patients younger than 45 years, and the smallest mean values in the group of patients over 65 years of age for both the dominant and the non-dominant hand. ANOVA test showed that although there is a difference, that difference is not a statistically significant one (Table 2).

<table>
<thead>
<tr>
<th>Age Group</th>
<th>N</th>
<th>Mean ± Std. Deviation</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAPM_DOMINANT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;45</td>
<td>9</td>
<td>17.11 ± 2.472</td>
<td>0.111</td>
</tr>
<tr>
<td>45-65</td>
<td>7</td>
<td>15.71 ± 2.215</td>
<td></td>
</tr>
<tr>
<td>&gt;65</td>
<td>7</td>
<td>14.43 ± 2.507</td>
<td></td>
</tr>
<tr>
<td>TAPM_NON-DOMINANT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;=45</td>
<td>9</td>
<td>15.67 ± 2.550</td>
<td>0.156</td>
</tr>
<tr>
<td>46-65</td>
<td>7</td>
<td>14.26 ± 2.220</td>
<td></td>
</tr>
<tr>
<td>&gt;66</td>
<td>7</td>
<td>13.14 ± 2.688</td>
<td></td>
</tr>
</tbody>
</table>

According to the subjective global assessment, in our study there were 15 well-nourished patients (SGA “A”), 6 patients with suspect/moderate malnutrition (SGA “B”), and 2 patients with severe malnutrition (SGA “C”). With SGA, a questionnaire with a score ranging from 0 to 12 points was considered statistically significant. All data were expressed as mean ± standard deviation and analyzed by SPSS 12.0 software.
Regarding the gender, a significant difference has been identified in the studies carried out. Conditions comprise the history of the disease with habits and changes in respect to nutrition, other studies who have poorer nutritional status at admission. The mean value of TAPM was higher compared to the other studies which means that our patients arrived at a hospital with a lower nutritional risk compared to patients in the other clinics at the hospital of the University of Rio de Janeiro. There is evidence that the muscle of the APM is the only muscle in the body that could be directly measured. Measurement of the thickness of APM is fast, easy, low cost and non-invasive.

The majority of critically ill patients, globally, do not receive proper nutrition during hospital work, measuring of the body compartment is a part of a routine physical examination. The correlation between TAPM in the dominant hand and the other anthropometric measures. The correlation between TAPM in the dominant hand and the other measures at the centre of the palm. It overlies the metacarpal bones and the muscles. Anatomically, it is a muscle of the hand with two heads that (1) are separated into two components of the body and (2) which can lead to its reduction. Changes in muscle mass are a good indicator of the patient's nutritional status and moreover of the body compartment. Their measurement are more and more proved in medical and clinical practice. (10)

Discussion

Measurement of the thickness of adductor pollicis muscle on the dominant hand is superior to the non-dominant one and the values are always higher. There is evidence that the muscle of the APM is the only muscle in the body that could be directly measured. Measurement of the thickness of APM is fast, easy, low cost and non-invasive.

An assessment of the thickness of the adductor pollicis muscle (APM) has been reported for clinical practice. (10)

Table 4 shows the correlation of the thickness of adductor pollicis muscle in relation to the other measures at the centre of the palm.

<table>
<thead>
<tr>
<th>Measure</th>
<th>N</th>
<th>COR</th>
<th>Sig (2-tailed)</th>
<th>Pearson Correlation</th>
<th>N</th>
<th>Sig (2-tailed)</th>
<th>Pearson Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAPM_DOMINANT</td>
<td>000 000 000 000 000 000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
</tr>
<tr>
<td>TAPM_NON-DOMINANT</td>
<td>000 000 000 000 000 000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
</tr>
<tr>
<td>MAMC</td>
<td>000 000 000 000 000 000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
</tr>
<tr>
<td>TST</td>
<td>000 000 000 000 000 000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
</tr>
<tr>
<td>TAPM_DOMINANT</td>
<td>000 000 000 000 000 000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
</tr>
<tr>
<td>TAPM_NON-DOMINANT</td>
<td>000 000 000 000 000 000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
</tr>
<tr>
<td>MAMC</td>
<td>000 000 000 000 000 000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
</tr>
<tr>
<td>TST</td>
<td>000 000 000 000 000 000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
<td>1</td>
<td>0.000</td>
</tr>
</tbody>
</table>

- Correlation is significant at 0.01 level (2-tailed).
- Correlation is significant at 0.05 level (2-tailed).

The second study of Lameu et al. performed with patients in the wards of the Medical Clinic from the Hospital of the University of Rio de Janeiro, found out an average of TAPM for the both sexes of the dominant hand was 11.5 ± 2.76 mm. (13) Different methodological approaches resulted in different values of muscle for the both sexes of the dominant hand was 11.5 ± 2.76 mm. (13) However, Freitas et al. in their study that included 82 cancer patients observed minor variations of TAPM on the dominant hand for both sexes and amounted to (13 ± 3.2 mm). (15)
The determination of TAPM in the non-dominant hand is correlated to MAC, 0.493 (p = 0.017), MAMS 0.602 (p = 0.003), and TST, 0.127 (p = 0.565). The obtained statistical results indicated a significant positive correlation between the values of TAPM and anthropometric parameters, but the correlation between the values of TAPM and AC, AMA and TSF measurements. (19) Similar to the study by Rosalie et al. [35], with included 124 patients who underwent large digestive surgery where the values of TAPM on both hands correlated positively in severe malnourished patients (SGA-C) compared to patients scored as patients with mild malnutrition (SGA-B) (right hand = 16.93 ± 2.16 mm and left hand = 15.69 ± 2.06 mm), and the lowest in the group C, 12.50 ± 2.54 mm in the dominant hand and 10.00 in the non-dominant hand.

The SGA is the gold standard for subjective evaluation of malnutrition. Rezende et al., 2004; Eisenhofer et al., 2005; Prim Care. The most of the studies show that the thickness of adductor pollicis muscle was used as a predictor of the outcome of a critical illness, it has been determined that 25% of patients are severely undernourished. The value of TAPM in the left (12.3 ± 5.5 mm) and in the right hand (12.9 ± 5.3 mm) is significantly lower (p < 0.001) in severe malnourished patients (SGA-C) compared to patients scored as patients with moderate malnutrition (SGA-B) (right hand = 16.8 ± 5.7 mm and left hand = 15.9 ± 5.9 mm).

Conclusion

The determination of TAPM is important. It correlates well in different age groups. Gonzalez et al. found that the thickness of adductor pollicis muscle in individuals with a small, medium or large body frame, evaluated by the wrist circumference. The thickness of adductor pollicis muscle is a predictor of nutritional status and can be influenced by other factors. Lameu et al. emphasized the body mass, but can be influenced by other factors.

The results from our study correspond to the results from the others studies showing that the muscle-thickness values of TAPM in the left (12.5 ± 5.5 mm) and in the right hand (12.9 ± 5.3 mm) is significantly lower (p < 0.001) in severe malnourished patients (SGA-C) compared to patients scored as patients with mild malnutrition (SGA-B) (right hand = 16.8 ± 5.7 mm and left hand = 15.8 ± 5.9 mm). From this it follows that a significant correlation between SGA and TAPM exists only in patients who are well-nourished (SGA-A) (right hand = 17.2 ± 5.4 mm and left hand = 15.8 ± 4.6 mm). From this it can be concluded that a significant correlation between MAC, MAMS, and TST, 0.127 (p = 0.565) and CAFL, 0.533 (p = 0.009), and there is no correlation to TST, 0.127 (p = 0.565).
Корелацијата помеѓу дебелината на адукторниот мускул на палецот и другите адукторни мускули на палецот беше највисока кај добри хранетите пациенти. Според субјективната глобална процена, средната вредност на дебелината на над 65 години како за доминантна (14,43 ± 2,50), така и за не-доминантна рака (14,47 ± 2,67). 


Вредност на дебелината на адукторниот мускул на палецот беше измерена кај пациентите за доминантната (17,11 ± 2,47) и за не-доминантната рака (15,67 ± 2,55). Најмалата средна вредност на дебелината на надлактица, обем на подколеница, дебелина на адукторниот мускул на палецот кај пациенти помлади од 45 години беше највисока и за доминантна рака, и 16,67 ± 2,16 кај мажи 13,00 ± 1,73 кај женки за доминантна рака, и 15,24 ± 2,11 за не-доминантна рака.

INCREASED THICKNESS OF ADUCTION POLLS MUSCLE – A RELIABLE METHOD FOR NUTRITIONAL ...

ORIGINAL ARTICLE

ABSTRACT

Introduction: Some clinical evidence was produced into the practice of neuromuscular blocking drugs. Since then, the use of these drugs has become widespread and common. A number of general anaesthetics have been introduced into practice, and the use of neuromuscular blocking drugs has become a standard part of modern anaesthesia. The aim of this study was to compare the incidence of clinical signs of residual neuromuscular block at the PACU in two groups of patients receiving long acting NMBD. Material and Method: Prospective descriptive study conducted at the University Surgical Clinic St. Naum Ohridski – Skopje in 78 patients receiving general anesthesia with long acting NMBD. Patients are divided into two groups depending if neuromuscular function was monitored or not intraoperatively. Results: The incidence of clinical signs of RNMB at the PACU was 20.51% in the unmonitored and 15.38% in the monitored group. There was higher incidence in mild hypoxemia and airway muscle weakness in the unmonitored group. Conclusion: Residual neuromuscular block continues to be a common clinical occurrence in PACU. In the early recovery period after anesthesia it is difficult to differentiate the signs of RNMB of the effects of the drugs used during anesthesia. Although there are strong recommendations for use of neuromuscular monitoring, still many anesthesiologists base their neuromuscular management on clinical signs.

Key words: neuromuscular blocking drug, postanesthesia care unit, residual neuromuscular block.

Corresponding author: Aleksandar Radoeshki, University Surgical Clinic "Ss Naum Ohridski", Skopje, Macedonia. E-mail: radoeshki@yahoo.com
Introduction

Residual neuromuscular block (RNMB) is a preventable safety problem. Recent outcome studies suggest that use of intermediate acting non-depolarizing neuromuscular blocking agents (NMBD) instead of long acting ones is associated with lower incidence of RNMB (1, 2). RNMB is more likely to occur when NMBD is administered, especially if a long acting NMBD is used in combination with a short acting one (3).

In our study we compared the incidence of clinical signs of RNMB in PACU in two groups of patients, group A (not monitored) and group B (monitored). The clinical signs of RNMB were registered at PACU as mild hypoxemia, SpO2 below 90% and/or with oxygen support via facemask of 4L/min; severe hypoxemia, SpO2 below 90% and/or with signs of respiratory distress, with respiratory rates higher than 20 breaths per minute and activation of accessory respiratory musculature; inability to take a deep breath on command; airway muscle weakness, with difficulty in breathing or swallowing; need for airway management, use of Guedel airway, laryngeal mask or intubation; pulmonary complications.

The choice of drugs used for premedication and anesthesia as well as neuromuscular management changed and modifications of the custom practice of each anesthesiologist were not performed. Data were statistically analyzed. Fisher's exact test was used for comparison of variables between the non monitored and monitored group. Categorical variables are expressed as percentages and continuous variables as mean and standard deviation. Statistical significance was assessed with a confidence level of 95% (P<0.05).

The clinical signs of RNMB were observed more often in PACU in group B (n=39) where neuromuscular function was monitored. Routine care for the patients was not altered and modifications of the custom practice of each anesthesiologist were not performed.

RNMB is a clinical syndrome characterized by abnormal or incomplete recovery of peripheral nerve stimulation compared to visual assessment. The quantitative method, on the other hand, provides more objective data on neuromuscular monitoring. It provides accurate, reliable and objective data on neuromuscular block which can be used to guide reversal of neuromuscular function, as train-of-four (TOF) ratio of below 0.7. More recent data suggest that a TOF ratio of <0.9 is "the golden rule" for RNMB instead (1, 2). Probably the most stressed in reducing the incidence of RNMB is the accurate definition of RNMB would be presence of signs and symptoms of muscle weakness in the early postoperative period after administration of NMBD (3).

What is residual neuromuscular block? When quantitative monitoring of the neuromuscular function in the operating room, PACU and ICU is introduced, RNMB is generally considered as residual paralysis in PACU can affect morbidity in patients recovering from general anesthesia and is a risk factor that can affect early postoperative outcomes. The adverse effects of RNMB are less frequent when monitoring is introduced. The accurate definition of RNMB is: (a) the train-of-four (TOF) count ratio is reduced below 0.9; (b) the second twitch count (2TOF) is reduced below 0.9; (c) the third and fourth twitches are lost (3TOF, 4TOF).

RNMD is a complication of general anesthesia. RNMD is a preventable safety problem. Recent outcome studies suggest that use of intermediate acting NMBD instead of long acting ones is associated with lower incidence of RNMD (1, 2). RNMD is more likely to occur when NMBD is administered, especially if a long acting NMBD is used in combination with a short acting one (3).

In our study we compared the incidence of clinical signs of RNMD in PACU in two groups of patients, group A (not monitored) and group B (monitored). The clinical signs of RNMD were registered at PACU as mild hypoxemia, SpO2 below 90% and/or with oxygen support via facemask of 4L/min; severe hypoxemia, SpO2 below 90% and/or with signs of respiratory distress, with respiratory rates higher than 20 breaths per minute and activation of accessory respiratory musculature; inability to take a deep breath on command; airway muscle weakness, with difficulty in breathing or swallowing; need for airway management, use of Guedel airway, laryngeal mask or intubation; pulmonary complications.

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There was no significant difference in incidence of clinical signs between the groups. This is due to differences in the management of RNMB. All patients were administered a reversal of NMB, but this is dependent on the type of reversal used in each group. There was an insignificant statistical difference in incidence of clinical signs of RNMB in both groups (p=0.572835). In both groups, there were no incidences of severe hypoxemia, signs of respiratory distress, nor the need for additional airway management or need for advanced ventilation support.

### Table 1: Demographic data of patients in each group

<table>
<thead>
<tr>
<th>Group</th>
<th>Gender (m/f)</th>
<th>Age (yr)</th>
<th>Height (cm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>23/16</td>
<td>48.5±15.09</td>
<td>170.4±8.11</td>
<td>72.1±15.38</td>
</tr>
<tr>
<td>B</td>
<td>18/21</td>
<td>53.3±14.36</td>
<td>167.6±5.43</td>
<td>71.5±14.65</td>
</tr>
</tbody>
</table>

### Table 2: Comorbidities of patients in each group

<table>
<thead>
<tr>
<th>Comorbidity</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>15.38%</td>
<td>17.95%</td>
</tr>
<tr>
<td>Respiratory</td>
<td>5.13%</td>
<td>7.69%</td>
</tr>
<tr>
<td>Diabetic Melitus</td>
<td>5.13%</td>
<td>7.69%</td>
</tr>
<tr>
<td>Smokers</td>
<td>38.46%</td>
<td>35.90%</td>
</tr>
</tbody>
</table>

In cardiovascular comorbidities, patients with heart failure, according to the NYHA classification, and patients with known coronary artery disease were included. In respiratory comorbidities, patients with a history of COPD, history of asthma, history of sleep apnea, and recent respiratory infection within 2 weeks of surgery were included.

### Table 3: Surgical data

<table>
<thead>
<tr>
<th>Procedure Type</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective</td>
<td>84.62%</td>
<td>94.87%</td>
</tr>
<tr>
<td>Abdominal/Other</td>
<td>15.38%</td>
<td>5.13%</td>
</tr>
</tbody>
</table>

The duration of surgical procedure was longer in the monitored group.

### Table 4: Anesthesia management and LOS at PACU

<table>
<thead>
<tr>
<th>Management Type</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatile/TIVA</td>
<td>2/37</td>
<td>9/30</td>
</tr>
<tr>
<td>Time to P02 of PACU (min)</td>
<td>67.2±23.19</td>
<td>59.2±19.49</td>
</tr>
</tbody>
</table>

### Table 5: Clinical signs of RNMB

<table>
<thead>
<tr>
<th>Clinical Sign</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild hypoxemia</td>
<td>5.13%</td>
<td>10.26%</td>
</tr>
<tr>
<td>Inability for deep breath</td>
<td>5.13%</td>
<td>5.13%</td>
</tr>
<tr>
<td>Airway muscle weakness</td>
<td>5.13%</td>
<td>2.56%</td>
</tr>
</tbody>
</table>

There was no significant difference in incidence of clinical signs of RNMB in both groups.
Residual neuromuscular block can be a factor that can potentially affect recovery after anesthesia. The effects of the drug used during anesthesia, "may produce somatosensory or motor changes that may be clinically significant and have a major impact on the patient's ability to breathe, perform activities of daily living, or work," according to the authors. Therefore, it is important to improve neuromuscular management in order to reduce the incidence of RNMB and its associated complications.

References


Low flow anaesthesia – an introduction and invitation

This text is an invitation and an introduction to LFA. The low flow technique is just one example of a simple and logical process, but yet apparently cumbersome to apply. It is simple and logical because it is the way the most GAs in the world are provided: volatile.

TIVA is another other way of GA. The LFA technique learning starts by understanding that the anesthetic gases follow exactly the same pathway and physical rules as the oxygen! And, in fact, of any other gases: that is from high pressure to low pressure. The only difference, and this element is capital to understand, is that oxygen is consumed in the metabolic process while the volatile anesthetics are not. The rest is pure physics.

Let's go back in school when we learned about the laws of gases and everything becomes simple. If we imagine the body as a house with multiple rooms, and each room with a different volume and different things inside, the anesthetic gas will fill in gradually all of them until the partial pressure equilibrates all throughout the house.

The human body is built differently; there are no empty spaces, but the rooms are filled with different tissues with different capacities to absorb the anesthetic gases. However, when the partial pressure of the gas in all the body’s rooms is equalised, there is no more absorption. The body is equilibrated with the anesthesia circuit in terms of partial pressures. If theoretically the anesthesia machines were perfectly hermetic, once the body has equilibrated throughout all its compartments and with the anesthesia machine, there will be no more absorption of gas.

It becomes logical that at this point the vaporizers could be closed. Everything is inside the body.
3. But the reality is different:

1. The anesthesia machines and breathing circuits have leaks.

2. Once the surgeon has made the incision the body stops being completely closed. The loss is minimal, but for the sake of theoretical correctness it is not zero.

3. There is a very little metabolism of the anesthetic gases. At this point let's follow a step by step approach: the brain (the central point where the $\text{V}_{\text{AA}}$ acts) has equilibrated, ok. The only leaks are now represented by: the anesthesia machine and circuit and the losses through the surgical wound. This is the only volume of gas that we need to feed to the circuit and patient from this moment on. Anything above that is lost to the scavenger because it is not absorbed anymore. As simple as that!

But … wait a minute … haven't we forgotten something? Of course, the sampling line! That tiny little tubing that takes gas from the patient and brings it to the gas analyzer and helps us see what happens in the whole system. If the gas analyzer is diverting the gas to the scavenger through its exhaust port, we need to compensate for that too. If it is returned to the circuit, then, theoretically, nothing is lost over there.

As you saw up to now all is plain clear. The paradox starts exactly here: we work with volatile anesthetic almost on a daily basis. It is our "bread and butter". And yet, for different reasons, many practitioners are reluctant to reduce the flows.

As in many other fields of human activity, an idea came across someone's mind many years before the technical development keeps pace with the thinking. That method was slowly forgotten. Generation after another doesn't teach that method and, when the machinery comes to reality, there are almost no teachers to apply the theory.

It happened with the regional anesthesia. The idea was there long ago (August Bier), but the spinal needles were not the same needles we know today. Think of the LMA: in the beginning the anesthesia community was reluctant to use it. Would you start an OR today without an LMA at hand? And the examples can go on.

The LFA, however, is very easy to understand. It is the anesthesia we are performing every day … but at a much more logical level.

At this point I need to warn every early enthusiast that as any high quality method, it must be understood and applied at slow and progressive paces. The theory is ok, but it must be applied in small aliquots, otherwise, instead of enjoying an excellent academic and clinical tool, we invite disaster through the main gate. It takes time and continuity, but at the end every clinician would wonder how he/she was ever able to work with higher flows before.

When starting learning LFA a few requirements must be met:

1. Solid reading and understanding of the theory,
2. Know your anesthesia machine: do you return the sampled gas to the circuit? Yes (CCA)? No?,
4. Do you have a gas analyzer?

All these elements are extremely important. Any flow, the gas composition is easily altered. Here's how you can do it:

1. Open the oxygen tap to 10 times the theoretical basal oxygen consumption. The vaporizer (I use SEV) is opened to 8%.
2. It doesn't matter if you decide to ventilate or let the patient breathe, it will be noticed that the ETSEV and the MAC reach 1.5 MAC in roughly 1 minute, but this is only an approximation. At this point the total flow can be reduced to the theoretical oxygen consumption plus the leaks, but the SEV vaporizer must be left open to 8%. Usually, a small decrease in the MAC can be noticed but soon after the MAC will start rising again (signaling the vessel rich tissues are almost saturated).
3. Now the SEV vaporizer dial can be slowly reduced as guided by the gas analyzer.

As many other fields of human activity, an idea came across someone's mind many years before the technical development keeps pace with the thinking. That method was slowly forgotten. Generation after another doesn't teach that method and, when the machinery comes to reality, there are almost no teachers to apply the theory.
For optimum flow delivery and maintenance,
the level of economy/waste we are and some commonly exist the desired level of flow.
When I talked about it had absolutely NO idea where the scavenged gases go beyond the OR wall.
While addressing the economical aspect of LFA (cost reduction can reach as much as 80%)
Once I asked a younger colleague why is he using in the maintenance phase 1 LPM of O2
difficulties could be in small settings.
In our days we are usually very interested in regional blocks, sepsis, trauma etc. These are
The more the flow is reduced the more important is the configuration of the circuit and the
At times I am asked: "What is the best way to apply LFA?" This is a normal question but
According to LFA: what patient are we having, what is the length of the surgery,
What happen on the monitor (gas analyzer) and bellows or balloon (if the patient breathes). I
I would suggest reducing both gases in 50 ml steps each (total 100 ml/min) and just follow
In our practice? Possible.
I talked about it had absolutely NO idea where the scavenged gases go beyond the OR wall.
the general answer was: as long as I don't pay for them why should I bother. Is it so?
Imagine someone would ask which is the best way to drive a car from point A to B! Of course all cars have the same main commands. But the way we drive depends
Most clinicians are still reluctant to reduce flow to less than 500 ml/min. It is normal to
As long as we don't have a hypoxic mixture. Using only oxygen as the carrier gas makes the whole process very simple as
the answer is less simple. Imagine someone would ask which is the best way to drive a car from point A to B! Of course all cars have the same main commands. But the way we drive depends
The same is valid for LFA: what patient are we having, what is the length of the surgery,
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OBSTETRIC ANESTHESIA: PRESENT ASPECTS

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ABSTRACT

The study reviews the well-established ways to apply labor analgesia which are practiced widely, with a simultaneous analytical overview of current and influential aspects in the field of obstetric anesthesia. In the introduction, attention is paid to the global morbidity and the mortality trend in the field of obstetric anesthesia, which shows positive changes, primarily as a result of more frequent application of regional obstetric anesthesia in general. The current procedures and methods with their specifics have been analyzed, as well as up-to-date data regarding side effects, which have been duly addressed. Special emphasis on the respiratory depression risk caused by intrathecal opioid route is considered, whose usability is very common today. From that aspect, the study is conceived as an opportunity for better information and understanding of the current aspects of obstetric anesthesia, with the ultimate goal of improving the final outcome of the process of labor, thus implicating better well-being for both mother and newborn.

Key words: obstetrics, labor analgesia, procedures, aspects.

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REVIEW

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Obstetric Anesthesia Risk

Today, the inclusion of general anesthesia in obstetrics is represented in much smaller percentage than decades before. The increasing popularity of regional as opposed to general anesthesia was due not only to its practical and simple application, but also came as a result of a reduced risk of serious or fatal complications, as observed with general anesthesia. Historically, anesthesia and the complications it caused was in sixth place out of the total of maternal death causes in the USA (3.3%). In the next 5 years (1985-1990), as a result of general anesthesia, there were observed 32 deaths (per 1 million births) while with parturient receiving regional anesthesia there were reported 1.9 total deaths per 1 million. According to recent data, in the period until the 21st century (the year 2000), total mortality rate was further decreased and a total of 1,6 deaths was registered. The conclusion is that the percentage was mostly a result of the replacement of general with regional analgesia (1).

Postpartum respiratory compromise, especially in obese patients, remains a significant factor in the obstetric mortality rate. To determine the possible causes, a retrospective study of 5,036 parturient delivered with CS reports that postpartum pain treatment with a multimodal approach of neuroaxial opioids (morphine or fentanyl), combined with oral analgesics (NSAIDs or morphine agents), neither led to an increased risk of respiratory complications, nor to serious respiratory desaturation, so the causes of postoperative respiratory compromise should be sought elsewhere (2 3 4).

Some other conditions, such as: early pre-eclampsia (≤34 weeks) (5 6), sepsis, which shows a continuously increase to 10% per year during the last decade (7), and postpartum hemorrhage (PPH), are the most common and the most important factors for perinatal mortality. An interesting fact is that the retrospective of National Wide Inpatient Sample from 2013 shows a double increase in serious non-atonic PPH (1.9 / 1,000 in 1999 to 4.2 / 1000 in 2008) which necessitated the need for development of an urgent strategic and multidisciplinary approach to PPH protocols, especially in low-cost countries (8).

Moreover, recent experience reports that the application of classical laryngeal mask (LM) in parturient with impossible or difficult intubation leads to successful resolution in the most of the cases (68%), so LM is considered as a valuable alternative for obstetrics airway management (9, 10).

Epidural Analgesia for Vaginal Delivery

Epidural analgesia (EDA) became particularly popular in the field of obstetrics ever since the '80s of the last century. It has provided superior analgesia over other methods and is still the most exploited way for labor pain relief. Epidural continuous infusion of low concentrated anesthetics combined with lipophilic opioid, has proved to be very effective for maternity pain relief, with an excellent control of the intensity and duration of labor pain with minimal motor blockade (11).

For adequate pain relief of the birth process in the first stage of labor, what is required is epidural sensory block to T10 level, while T4 level is required for eventual CS. In the second labor stage, where somatic labor pain is predominant, analgesia at the sacral S2-S4 level is required.
Spinal Single-shot Analgesia for Vaginal Delivery

Anesthetic dosage has to provide adequate conditions for operative delivery (C5). Often, analgesia activation at the second labor stage (S2-S4) is carried out with an additional dilatation or when there is an obstetric decision for surgical completion of delivery, when spinal period) is programmed from the manufacturer, anesthesiologist or partly from the parturient. Most of that, spinal analgesia should be applied only with advanced labors with appropriate cervical onset of the first labor pains. Total volume, speed of delivery and safe period of locking (lock-out period) is available in many maternity hospitals. The delivery of the labor epidural analgesia is an available option in many maternity hospitals. The limited duration of the total anesthetic amount compared to continuous infusion.

Single-shot analgesia for painless delivery is an alternative method of epidural analgesia and is mainly chosen where there is no service of labor epidural analgesia. The limited duration of single-shot analgesia is an advantage. When comparing the two most exploited EDA regimes - intermittent bolus dosage versus continuous epidural labor infusion - the groups, so in cases of accidental dural puncture, re-insertion of the epidural catheter or other epidural problems when placing the catheter, general dissatisfaction among parturient of both EDA or obstetric service. 4.

The question about whether epidural may lead to an increased rate of operative or instrumental delivery is still remained a present topic of the controversy. The usage of a mixture of low concentrations of local anesthetic (0.125 -0.0625% bupivacaine) with lipophilic opioids (mostly fentanyl 1-5 μgr / ml) reduces these negative influences over labor, as well as the weakness of the legs with difficulty of standing or walking, 2. difficulty to urinate, 3. pruritus, 4. nausea and vomiting when using higher opioid doses, 5. hypotension as the common early effect of regional anesthesia and 6. fever independent of infection (6-23%). Dural membrane perforation prolongation of the second stage or instrumental labor procedures, thus forcing such a manner approach.

The treatment of PDPG, according to the latest Cohrane’s Review (classical initiating of epidural (cervical dilation > 4-5 cm), the multicenter Cohrane analytical ECTS study conducted in 15.752 parturient receiving early or late epidural (Cochrane, MEDLINE, EMBASE data base analysis until 2014), reports that there was no difference both in terms of experience), insertion of epidural catheter between 5-6 cm in the epidural space compared to < 5 cm or > 6 cm and good quality of labor analgesia in the first 45 minutes, leads to high general dissatisfaction among parturient of both EDA or obstetric service. 4.

Nowadays, using the infusion pumps and perfusors in the form of patient-controlled analgesia (PCEA) becomes widespread. The access allows earlier initiation of the pump and continuous epidural analgesia during labor. Cervical dilation or the position of the parturient during insertion of the epidural catheter are factors that do not affect the quality of labor analgesia (classical initiating of epidural (cervical dilation > 4-5 cm), the multicenter Cohrane analytical study conducted in 15.752 parturient receiving early or late epidural (Cochrane, MEDLINE, EMBASE data base analysis until 2014), reports that there was no difference both in terms of experience), insertion of epidural catheter between 5-6 cm in the epidural space compared to < 5 cm or > 6 cm and good quality of labor analgesia in the first 45 minutes, leads to high general dissatisfaction among parturient of both EDA or obstetric service. 4.

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combined spinal-epidural anesthesia (CSE)

The Cochrane-revival study, which included 27 other studies in the relevant matters with 3274 patients, shows that CSE compared to EDA, owns higher efficiency in relation to the beginning analgesia, but further warrant studies are needed. Caution should be exercised in comparing both methods, there are no significant differences in rates of maternal hypotension, hypotension or neonatal Apgar scores and umbilical pH values. However, one can conclude that there are no compelling reasons for favoring CSE over EDA in terms of better adverse effects and/or costs.

Shivering is decreased, though the incidence of clinically significant respiratory depression is low, less than associated with the systemic opioid administration (19). Respiratory depression, though the type 3 inhibitors, may be effective at reducing opioid-induced respiratory depression. Opioid antagonists such as naloxone used to prevent or treat opioid-induced respiratory depression. Spinal anesthesia with a mixture of local anesthetics with opioid (morphine, ITN) is based on improving spinal analgesia for CS in a trial of 80 patients receiving tramadol. These researchers have recently focused on non-opioid drugs such as serotonin receptor agonists. Early studies have shown that intrathecal serotonin can block the CSE complex expressing neurokinin-1 receptors are selectively inhibited by opioids, and therefore complex located in the medulla has been identified as the site responsible for the decrease in plasma cortisol level and increase in plasma ACTH (9).

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11. To the best of my belief, no conflict of interest exists.


The study evaluates the established methods of obstetric analgesia that are widely practiced, with a simultaneous attention to the current and influential ideas from obstetric anaesthesia. In the introduction, there is an overview of morbidity and mortality in obstetric anaesthesia, which have experienced positive changes as a result of the increased use of regional anaesthesia in obstetrics. The analysis covers certain methods and specifics for obstetric analgesia, as well as contemporary ideas about the etiology of unwanted effects, with a special attention to the risk of respiratory depression caused by intrathecal opioid application, which is now frequently used. From this aspect, the presented views are a possibility for better information and understanding of the current aspects of obstetric anaesthesia, with the final goal to improve the outcome of the childbirth process for both the mother and the baby.

**Keywords:** obstetric anaesthesia, procedures, labour analgesia.

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**ABSTRACT**

**Introduction:** Axillary status is an important prognostic factor for breast carcinoma. The introduction of a minimally invasive procedure for determining the axillary status, detection and biopsy of the sentinel lymph node (SLND), allows the removal of only one node. This can predict the condition of the other nodes. The possibility of occurrence of skip metastasis in the axillary pit can give wrong results for the occupancy at the axillary pit.

**Aim:** Analysis of 144 patients surgically treated for breast cancer by one surgeon in 2015 in order to assess the percentage of skip metastasis.

**Materials and methods:** We analyzed the histopathological results of 144 patients surgically treated by one surgeon, where the axillary lymph node level (1-3) was determined and marked intraoperatively.

**Results:** There were analyzed 144 patients, with a mean age of 57.3 years, with a mean tumor size of 29.54 mm ± 18.89, with a mean of 15.45 lymph nodes removed, and from the third level 2.61. Positive for metastatic deposits were 3.76%, and positive from the third level were 0.37%. Only in two patients (1.38%) were detected single skip metastasis in the first level and positive nodes in the third level, but there was no patient's positivity in the third level if there were no positive nodes in the first and second levels.

**Conclusion:** The percentage of skip metastasis in our study was 1.38%, which is a small percentage, allowing the application of the sentinel lymph node detection and biopsy method for predicting axillary status and predicting the real situation of other nodes in the axillary pit.

**Key words:** axillary lymphadenectomy, breast cancer, skip metastasis.

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Introduction

Axillary status is an important prognostic factor for the breast carcinoma. The introduction of a minimally invasive procedure for determining the axillary status, detection and biopsy of the sentinel lymph node (SLND), gives us the possibility to remove only one node. This can predict the condition of the other nodes. (1, 2) The possibility of the occurrence of the skip metastasis in the axillary pit, situation where metastases from breast cancer skip, jump lymph nodes which are on the way of spreading, and to go to the next level of lymph nodes, can give wrong results for the occupancy at the axillary pit. (3) This is the reason to explore our material for persistence of the skip metastases and if the same persist how many are present in our material.

Aim

The aim of the study was to detect persistence of the skip metastases from breast cancer in axillary pit in the operative materials of patients surgically treated by one surgeon in the year 2015.

Material and Methods

We analyzed, in the retrospective study, histopathological results of 144 patients surgically treated for breast cancer at the University Clinic for Thoracic Surgery in 2015, whereby intraoperatively level (1-3) of the lymph nodes in axillary pit were determined and marked. Radical surgical treatment of the breast (radical mastectomy or quadrantectomy) was done at patients, followed with radical lymphadenectomy of three levels of axillary pit. Each level of the axillary pit was marked, as later can be examined separately. All parameters, of the patients’ history and parameters from histopathological findings were put in the computer program Statistica 7, where the statistical analysis were done. The basic statistical analysis was done.

Results

There were analyzed 144 patients, with mean age of 57.3 years, with an average size of the tumor of 29.54 mm ± 18.89, with an average removed of 15.45 lymph nodes, from first level were removed mean 7.88; from second level were removed mean 4.95 and from the third level - 2.61.

Thus positive lymph nodes for metastatic deposits in whole axillary pit were mean 3.76, positive from the first level were mean 2.23; from the second level were positive mean 1.16 and positive from the third level were mean 0.37. There were fulfilled 144 patients, with mean age of 57.3 years, with an average size of the tumor of 29.54 mm ± 18.89, with an average removed of 15.45 lymph nodes, from first level were removed mean 7.88; from second level were removed mean 4.95 and from the third level - 2.61.

| TABLE 1. The main characteristics of the analyzed patients (n = 144) M±SD |
|-----------------|-----------------|-----------------|-----------------|
| **Age**         | 57.3            | 12.8            |
| **Tumor size (mm)** | 29.54          | 18.89           |
| **N**           | 144             | 144             |
| **%**           | 100             | 100             |

Discussion

Lymph drainages from the breast are well documented up to now, where the main drainages are in the lymph nodes in the axillary pit, and the small amount especially from the medial parts of the breast were drained in lymph nodes located parasternally, to lymph nodes located along the arteries mammary intern. Minimal amount of lymph liquid was derivated to the contra-lateral breast and subdiaphragmatic. (4,5)
Lymph drainage of the breast

Lymph drainage in the lymph nodes in axillary pit is in five grooves of nodes (pectoral, subscapular, lateral, central and subclavicular). From practical and surgical point of view lymph nodes in the axillary pit are derived in three levels: I level (laterally from lateral border of minor pectoral muscle), II level contains lymph nodes that were under minor pectoral muscle, and III level (top of the axilla) where the lymph nodes were located in medial position from the medial border of the minor pectoral muscle.

Spread of lymph drainage from the breast

In the past there were made several studies with the aim to examine the lymph drainage of the breast. They were performed on cadavers, but also in the patients, where different fluids as radiocoloid or different types of colors-methylene blue were used. These studies were more frequent especially after 1990, after introducing the sentinel node biopsy technique. In these studies, lymph drainage was presented to be mainly through lymphatic that gone to axillary pit 80-98%, 5-20% to lymph nodes which were up to a, mammary intern, retrosternally, especially from medial parts of the breast, retromammary in depth were detected at 17% and 3-6% were spread to contra lateral breast, and small amount drainage were in subdiaphragmatic lymph nodes. Much more were examined the way of spreading of lymph in the axial, and it was seen that mainly there was successive spread, first in first lymph node in the I level - named sentinel lymph node, than in other lymph nodes in I level, than in lymph nodes in II level and at the end in lymph nodes in III level. After that, the spread is in supraclavicular lymph nodes. This is the basic thesis for introducing sentinel lymph node biopsy technique. Giving radiocoloids in the breast (subareolar, perialeolar, intraparenchymic, peritumoral), these radiocoloids were detected after 2-4 hours in the first drainage lymph node - sentinel lymph node in axillary pit. The same situation is also with giving color-vital blue or methylene blue, where giving perareolar or peritumoral 10 to 20 minutes before surgery, there were detected colors in the first drainage lymph node - sentinel lymph node, in the axillary pit. Detection, extraction of this lymph node, and histological examination of this lymph node make possible to detect, thus the breast cancer involve this lymph node or if this lymph node was not involved with metastases, it is possible to assume that the other lymph nodes were not involved with metastases.

Normal spread of metastases, radiocoloid and methylene blue from breast to axillary lymph node

But in practice, it is not so easy, and the spreading is not always in this way. So, in the literature, in the study Pasta detected SLND in 86% in the lymph node of I level, 8,6% in II level and 2,8% in III level. Heuts detected SLND in 98% in axillary pit, in 20% in the lymph node according a, mammary intern. In patients with previous surgery before, especially if the surgery was in the upper lateral quadrant, there was present no sentinel lymph node in axillary pit. In few cases, in examination with static Gama camera, it was shown that after giving radiocoloids, the contrast was gone down in the subdiaphragmatic parts of the body. The appearance of the abnormal spread of the metastases in lymph nodes in axillary pit is not well examined. There were few hypothesis, that as abnormal lymph channel that goes directly...
abnormal, discontinued (skip) spread of metastases from breast to axillary lymph node. In the literature there were few publications about the skip metastasis. Sun J analyzed 1502 patients and detected skip metastases in 7.9% of all analyzed patients, or in 14.6% of the patients with positive metastases in axillary lymph nodes. Also he couldn’t associate the appearance of the skip metastases with any factor.

Rossen PP analyzed 1228 cases with breast cancer and detected skip metastases at only 1.6%, and this condition is not associated with the size of the tumor, its localization or the histology.

Loyd LR detected skip metastases in 1.6% of all patients, or 3.2% at positive for metastases in axillary lymph nodes. This percent is relatively small to decide to do axillary lymphadenectomy at all patients.

So, the technique of detecting and biopsy of the first drainage lymph node (sentinel lymph node) has possibility to give wrong results, which were result of spreading to other pools (parasternal, contra lateral breast, subdiafragmatic spread), but also of appearing of skip metastases in the other parts of axillary pit. These are the reason for success rate of detection of sentinel node to be in the range between 80 to 99%, with possibility of false negative results of 3 to 10%.

In our study we detected skip metastases in only two cases (1.36%), or 2.5% of patients with positive axillary findings, which is low, and we can use SLND biopsy safely.

**Conclusion**

The percentage of skip metastasis in our study was 1.38%, which is really a small percentage, that gives us right to apply the method for sentinel lymph node detection and biopsy for predicting axillary status and to predict the real situation of the other nodes in axillary pit.

**Conflict of Interest**

We have no conflict of interest to declare.

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APPROACH

HEPATIC RESSECTION SURGERY AND THE ANESTHETIC APPROACH

ABSTRACT

Liver resection can be associated with increased likelihood of massive bleeding. The blood loss presents major intraoperative issue. Bleeding is usually present in cirrhotic patients, but can be faced even in the patients with normal liver function undergoing massive liver resection. Correction of preoperative abnormal coagulation's tests, strong interaction between the surgeon and the anesthesiologist, and finally the anesthesia technique, may successfully reduce the bleeding intensity and blood transfusions requirements. This review will be focused on the anesthesiologist's role in minimizing the blood loss during hepatic resection in our case.

CASE REPORT

Intraoperative Hemorrhage During Hepatic Resection

ABSTRACT

Liver resection can be associated with increased likelihood of massive bleeding. The blood loss presents major intraoperative issue. Bleeding is usually present in cirrhotic patients, but can be faced even in the patients with normal liver function undergoing massive liver resection. Correction of preoperative abnormal coagulation's tests, strong interaction between the surgeon and the anesthesiologist, and finally the anesthesia technique, may successfully reduce the bleeding intensity and blood transfusions requirements. This review will be focused on the anesthesiologist's role in minimizing the blood loss during hepatic resection in our case.

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Massive bleeding is a major concern of liver resection. An increased intraoperative transfusion of blood components and large amounts of fluids can be administered due to massive bleeding. The tendency to overfill vascular beds and large amounts of blood transfusions is recently reported to be associated with worse outcome and increased mortality (1-4). Decreased liver function, liver failure, major liver tissue trauma, and primary liver tumors may be associated with abnormal coagulation. We report a case of a patient undergone to left lobe resection for suspected hepatic cell carcinoma.

**Case Report**

The patient, K. J., 75 years old white man, with no previous medical history, was referred to our institute and diagnosed with left liver lobe tumor. The preoperative consultation was unremarkable. Cardiac, respiratory, and liver examinations were within limits. Blood gases and other biochemistry examinations were within normal limits. The angio-CT scan examination (Fig 1, 2) revealed left lobe tumor sized 65 × 52 mm. Tumor marker Ca 19-9 was 91240 U/ml (normal values ≤ 35 U/ml).

The patient was premedicated with oral Diazepam 10 mg the night before the surgery, and morphine sulfate 10 mg intramuscularly 30 minutes before the induction of anesthesia. In the operating room, after peripheral venous cannula was inserted, right radial artery and right internal jugular vein were cannulated with a 20G arterial cannula and 7.5 F central venous catheter. A fast track anesthesia was made (Fentanyl 5 mcg/kg, Propofol 2 mg/kg, cis-atracurium 0.15 mg/kg). Monitoring included standard monitoring, central venous pressure and invasive blood pressure monitoring. The anesthesiologist tended to maintain CVP 5-6 cm H2O. The surgical technique consisted of large incision (Fig 3), preparation of the liver and large vessels (Fig 4), and anatomic left lobe resection (Fig 5, 6). After the resection, left lobe was sent for histopathology examination (Fig 7). During the operation, the estimated bleeding amount was 2000 ml in 10 minutes due to damage of a suprahepatic vein. There were anuria and temperature changes. In order to maintain the circulation, dopamine was administered. There were no complications with the liver lobe and the other organ systems. The abdominal cavity was closed. The patient was discharged with a normal liver function postoperatively. The patient, K. J., 75 years old white man, was referred to the gastrohepatologist and the oncologist for further follow-up.

**Introduction**

Massive bleeding is a major concern of liver resection. An increased intraoperative transfusion is required for stable hemodynamics. In this case, the left lobe tumor was successfully removed with a large incision and anatomic resection. The estimated bleeding amount was 2000 ml in 10 minutes due to damage of one suprahepatic vein. There were anuria and temperature changes. In order to maintain the circulation, dopamine was administered. There were no complications with the liver lobe and the other organ systems. The abdominal cavity was closed. The patient was discharged with a normal liver function postoperatively. The patient, K. J., 75 years old white man, was referred to the gastrohepatologist and the oncologist for further follow-up.
Hepatic vascular supply is a contribution of venous blood from portal vein and arterial one furnished by common hepatic artery. Venous blood supplies 60% of blood influx and 40% of blood coagulation testing (7) TEM tests all the interactions of coagulation factors, blood cells, and drugs. TEM is performed with the ROTEM whole blood anticoagulant analyzer (Tem Innovations GmbH, Munich). They allow testing in the presence of therapeutic heparin and provide differential diagnostic information to support decisions in point of care (POC) or in emergency laboratories became gold therapy. Application of TEM at the time of bleeding and blood transfusions (9). The use of cell saver machine can minimize bleeding and blood transfusion (8). Strict monitoring helps the anesthesiologist to maintain good hemodynamic profile and fluid balance. Avoiding overfilling can minimize bleeding and further dysfunction. It is mandatory to avoid all the hepatotoxic drugs as acetaminophen and avoidance of bleeding and blood transfusion (6). Hepatic protection can be done by N-acetilcysteine. Nevertheless, close coagulation monitoring during liver surgery can decrease the amount of bleeding and blood transfusions (5). Hyperfibrinolysis (8) should be monitored during the surgery to control bleeding and avoid blood transfusions. Preventing further liver dysfunction is important. Preoperative laboratory tests must be repeated for monitoring before surgery (9). The anesthesiologist must ensure good volume status and usually treated with fluid boluses, vasoconstrictors (phenylephrine, norepinephrine), and/or sympathomimetics.

Preventing further Liver Dysfunction

The incidence of hepatocellular insufficiency varies from 5% to 30% depending on the patient’s history. The most common causes are cirrhosis, hepatitis, and hepatic failure. Hepatic insufficiency can lead to liver failure, which can be fatal. Therefore, it is essential to monitor the patient’s liver function and to identify any signs of liver dysfunction early. The most common signs of liver dysfunction are an increased level of bilirubin, decreased level of albumin, and an increased level of AST and ALT.

Discussion

In conclusion, it is important to monitor the patient’s liver function during surgery to prevent further liver dysfunction. The anesthesiologist must ensure good volume status and usually treated with fluid boluses, vasoconstrictors (phenylephrine, norepinephrine), and/or sympathomimetics. Close coagulation monitoring during liver surgery can decrease the amount of bleeding and blood transfusions. Prevention of further liver dysfunction is important. The anesthesiologist must ensure good volume status and usually treated with fluid boluses, vasoconstrictors (phenylephrine, norepinephrine), and/or sympathomimetics. The anesthesiologist must ensure good volume status and usually treated with fluid boluses, vasoconstrictors (phenylephrine, norepinephrine), and/or sympathomimetics.


34. Wu CC. Does increasing the operating room time lead to more blood loss during liver resection? Arch Surg 1999; 134:25–9.


Guidelines for Authors

Macedonian Journal of Anaesthesia (MJA)
is a scientific journal of the Macedonian Society of Anaesthesia (MSA) and Macedonian Society of Critical Care Medicine (MSCCM). The aim of this specialized medical journal is to speed and promote scientific achievements, novelties, clinical experience, reviews, controversial topics in anesthesia, reanimation and intensive care. The Journal is published twice a year (April and November), but additional supplements might be published when needed. MJA publishes original (professional and scientific) articles, review articles, case reports, therapeutic and technological innovation, discussions, critics, impressions from meetings, information for international conferences and reviews of new books or variate.

Manuscripts that are published should have not been published previously. Manuscripts that have been previously published only in form of abstracts are eligible for publishing in the journal but should be followed by additional letter send to the Editor, where the abstract details (abstract number, which book of proceeding or doi, date and place) are noted.

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The manuscript should be written in English, followed by an abstract in Macedonian (after the references section).

The title of the manuscript written in CAPITAL LETTERS. Authors Surname and Name initial (Jovanov.J), without academic or other titles. Name and address of the institution where the authors come from with the subscribed digits in English. Abstract should include up to 250 words and should contain goals of the paper, important elements from the methodology, concisely displayed results and conclusion. Each abstract at the end must have Key words: in alphabetical order.

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  • Text organized in IMRaD
  • Acknowledgments
  • Authors Contribution
  • References
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Review articles, case reports, therapeutic and technological innovation, discussions, critics, impressions from meetings, information for international conferences and reviews of new books or variate may be written in different sequences and manners.

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TEXT

• Introduction,
• Material and Method,
• Results
• Discussion
• Conclusion

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Guidelines for Authors

Macedonian Journal of Anaesthesia

Introduction

The introduction section should include a literature overview in relevance to the elaborated problem. In this section, 3-5 key references are cited, and this section should not be longer than 2 pages.

Material and Method

The material and method sections include detailed description of the performances in the research as well as the statistical analyses used. This section should include: time during which the research was conducted, type of the study, place of where the research was undertaken, randomization or stratification used (clear description of the examined groups), exclusion and inclusion criteria, method, analysis types, apparatus and instruments used, and referent values of the examined features (in SI-International System units).

Results

Results are displayed in a simple manner with text, images, tables, and charts that are submitted in the text where the author wants to stand, titled and numbered appropriately. Additionally, on a separate document, all images and tables are sent together with the manuscript. The title and the number of the charts and tables are placed above them, while the explanations, abbreviations, and comments are placed below. The image title and number are placed below the image, with proper explanation.

Discussion

The discussion section emphasizes the key findings of the actual research and compares these results to other relevant literature data.

Conclusion

The conclusion section should not include more than 150 words and should be drawn from the relevant elaborated results.

Acknowledgment and Author Contributions

Sections are displayed after the conclusion and before the reference section.

References

This section includes only the cited references. The references are listed in order of appearance in the paper, and the citation is standard (numbers enclosed in small brackets in the same line with the text). For each reference, if more than three authors appear, the names of the first three authors are provided, followed by "et al.

Examples:

Journal references:


References used from abstracts are marked as (abstr.), and from letters with (letter).

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The abstract should include the title in capital letters and all the needed features as the English abstract only written in Macedonian with Times New Roman, font size 12 with Macedonian support in Microsoft Word.

Prepared manuscript should be submitted electronically to macedoniananesthesiology@gmail.com.

All manuscripts that don’t fulfill the above criteria will not be accepted for review.

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I ___________________.
Hereby declare that the article ____________________ (NAME OF THE ARTICLE) has not been previously published (fully or partially) previously.
We authors ________________________________ (FULL NAME AND SURNAMES OF THE AUTHORS) are responsible for the ethical, professional, and scientific content of the study.
I ________________________ (THE FIRST AUTHOR FULL NAME) declare Conflict of interest or declare non Conflict of interest.
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БЕЗБЕДНА АНЕЛГЕЗИЈА
менацірање на болка кога сте загрижени за безбедноста

I.V. paracetamol за прв пат во Европа е применет во 2001 година, а денес поради неговата докажана безбедност и ефикасност е прв од избор аналетеик и антипириетик.

Предоперативна и Интраоперативна Аналгезија:
Предоперативна аналгезија е дефинирана како третман кој што започнува пред оперативниот зафат се со цел да се превенира воспоставувањето на централна сензивалност на болка.
I.V. paracetamol е безбеден, добро толериран лек со докажана ефикасност како предоперативна и интраоперативна аналгезија за умерена до средна болка при оперативни зафати.
Голем број на клинички студии ја докажуваат ефикасноста на I.V. paracetamol како предоперативна и интраоперативна аналгезија.

КЛИНИЧКА СТУДИЈА:
Ефект од предоперативен i.v. paracetamol за постоперативни аналгетски потреби кај пациенти кои се подлекени на оперативни зафати. ASreenivasulu, KPrashnavathi, 2015
Цел: Да се утврди ефикасноста на предоперативната употреба на 1000mg i.v. paracetamol кај постоперативните болки и аналгетски потреби кај пациенти подлекени на хируршки зафати.
Метод: 60 пациенти беа поделени во две рандомизирани групи од по 30 пациенти.
На I. Група беа беше администрирано ампула од 1000mg i.v. paracetamol разредена 0,9%NaCl p-or 30 минути пред индукција (ГРУПА П).
На II. Група беа беше администрирано 1р. 0,9% NaCl p-or 100ml 30минути пред индукција (ГРУПА НС).
Сите пациенти беа индукирани со i.v. thiopentone 5mg/kg, i.v. fentanyl 2μg/kg, i.v. vecuronium 0.1mg/kg.
Постоперативниот резултат на болка беше мерен со Визуелна Аналогска Скала (ВАС) од "0-10". Исто така беше забележување и постоперативната употреба на tramadol како спасувачка аналгетик. Инциденцата на постоперативно гађање и повраќање (ПОГП) и други компликации исто така беше забележување во пост оперативниот период.
Резултатот на постоперативната болка беше забележуван во интервалот 15мин, 30мин, 1час, 2 часа, и 6 часа.
Заклучок: Предоперативна администрација на 1000mg i.v. paracetamol кај пациенти подлекени на оперативен зафат обезбедува статистички задоволителна аналгезија, и ја намалува постоперативната употреба на tramadol. Оттука 1000mg i.v. paracetamol може безбедно да се администрира како превенција при оперативни зафати.

Резултат:
Табелци 1: Споредба на средниот резултат на болка (ВАС) помеѓу двете групи

<table>
<thead>
<tr>
<th>Интервали</th>
<th>I Група П</th>
<th>II Група НС</th>
<th>P вредност</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 мин</td>
<td>2.06 ± 0.63</td>
<td>2.61 ± 0.56</td>
<td>0.0006</td>
</tr>
<tr>
<td>30 мин</td>
<td>2.35 ± 1.17</td>
<td>3.84 ± 1.55</td>
<td>0.0001</td>
</tr>
<tr>
<td>1 час</td>
<td>2.42 ± 1.12</td>
<td>2.87 ± 0.99</td>
<td>0.0989</td>
</tr>
<tr>
<td>2 часа</td>
<td>2.13 ± 1.06</td>
<td>2.52 ± 0.89</td>
<td>0.1219</td>
</tr>
<tr>
<td>6 часа</td>
<td>2 ± 0.52</td>
<td>2.52 ± 0.89</td>
<td>0.0549</td>
</tr>
</tbody>
</table>

Табелци 2: Споредба за потребите од tramadol помеѓу двете групи

<table>
<thead>
<tr>
<th>Интервали</th>
<th>I Група П</th>
<th>II Група НС</th>
<th>P вредност</th>
</tr>
</thead>
<tbody>
<tr>
<td>До 1 час</td>
<td>4 (12.90%)</td>
<td>15 (50%)</td>
<td>0.0002</td>
</tr>
<tr>
<td>1-2 часа</td>
<td>3 (9.68%)</td>
<td>2 (6.45%)</td>
<td>0.64</td>
</tr>
<tr>
<td>2-6 часа</td>
<td>1 (3.23%)</td>
<td>3 (9.68%)</td>
<td>0.301</td>
</tr>
<tr>
<td>Вкупно</td>
<td>8 (25.81%)</td>
<td>20 (64.52%)</td>
<td>0.002</td>
</tr>
</tbody>
</table>

МУЛТИМОДАЛНО МЕНАЦИРАЊЕ НА ПОСТООПЕРАТИВНА БОЛКА
I.V. Paracetamol е атрактивна компонента за мултиodalно менацирање на болка.

- Синергистично делување
- Зголемување на аналгетски ефект
- Значително намалување на болка
- Редукција на дозата на опиоидни лекови за -40% во првите 24 часа
- Намалување на несаканите ефекти поврзани со монотерапија на NSAID и опиоидни лекови
- Ублажување на акутна и хронична болка