

to be drug addicts during five years (January 2010 – December 2015).

Methods

An immunoassay screening tests to detect elevated levels of drugs classes in urine samples was performed. These screening assays provide a preliminary qualitative test result. Only positives urine specimens were analyzed with GC–MS for confirmation.

Results

Cannabis remains the most widely consumed illicit drug among young adults in Tunisia. The use of cannabis is frequently associated with other drugs, mainly buprenorphine, cocaine and ecstasy. Combined consumption has been observed in the post-revolutionary period, alarming the development of the phenomenon of “polydrug abuse” which can be more harmful, and dangerous than the abuse of a single drug by itself.

Conclusions

The results showed insignificant number of positive cases for illicit drugs such as cocaine, ecstasy (MDMA) and amphetamine consumptions (< 1%). Drug abuse among young people tends to be underestimated due to a lack of an exhaustive data.

The worsening scourge of drug use and drug addiction in Tunisia has been the subject of much debate and media output and has attracted the attention of the Tunisian Government, in particular the Ministry of Health. Several national and international measures have been put in place in Tunisia to combat this scourge, among them the launch of the strategy for setting up an information system, so that the actual scale of drug use and drug addiction can be regularly assessed and the effectiveness of preventive measures.

doi:10.1016/j.cca.2019.03.1582

M461

Performance evaluation of the new ope-free lithium assay on the atellica ch analyzer and advia chemistry systems

D. Patel, J. Dai
Siemens Healthcare Diagnostics Inc., Newark, DE, USA

Background-aim

Accurate lithium dosing is essential for minimizing side effects in patients undergoing lithium therapy for psychiatric disorders. The current lithium assay for the Atellica® CH Analyzer and ADVIA® Chemistry Systems (Siemens Healthineers) uses direct colorimetric endpoint chemistry to precisely quantify the lithium concentration in human serum and plasma. The concentration of lithium within the sample is directly proportional to an increase in absorbance. The reaction absorbance is measured at 505/694 nm, where an octylphenol ethoxylate (OPE)-based surfactant within the lithium assay reagent promotes a shift in its wavelength of maximum absorbance upon lithium binding to enhance the assay's sensitivity. In June of 2017 OPE compounds were added to the list

of banned substances for REACH (an environmental policy to remove certain chemicals from use within Europe). To address this, a new OPE-free lithium reagent has been developed* using an eco-friendly surfactant that closely matches the efficacy of the OPE-based surfactant currently in use.

Methods

Assay linearity and precision were assessed using Clinical and Laboratory Standards Institute protocols. A method comparison study between the current commercially used assay and the new OPE-free assay was conducted.

Results

The new OPE-free lithium assay is linear from 0.0 to 3.3 mmol/L lithium for all tested platforms. Repeatability remained <2.0%, and within-lab precision was <3.0% across the samples. The method comparison studies yielded a regression equation of $y = 1.01x - 0.04$ ($r = 0.99$) on the Atellica CH Analyzer and $y = 0.99x - 0.01$ ($r = 0.99$) on the ADVIA Chemistry XPT System. Herein, x denotes lithium concentration using the current OPE-inclusive lithium assay, and y describes the lithium concentration using the new OPE-free lithium assay. The new assay has a minimum of 15 days and 30 days of onboard stability on the Atellica CH Analyzer and ADVIA Chemistry XPT System respectively.

Conclusions

We conclude that the new, ecologically-safe lithium assay can measure lithium concentrations precisely and accurately over a broad, medically relevant range on the Atellica CH Analyzer and ADVIA Chemistry Systems.

*Under development. Not commercially available. Future availability cannot be guaranteed.

doi:10.1016/j.cca.2019.03.1583

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Occupational exposure to pesticides in orchard workers and adverse health effects at clinical and biochemical level

S. Cekovska^a, K. Tosheska-Trajkovska^a, S. Stoleski^b, V. Soleva^c, J. Brezovska-Kavrakova^a, D. Labudovik^a, I. Kostovska^a, J. Bogdanska^a
^aDepartment of medical and experimental biochemistry, Medical Faculty, University Ss Cyril and Methodius, Skopje, Macedonia
^bInstitute for Occupational Health of R. Macedonia, WHO CC, Skopje, Macedonia
^cPrivate health institution Avicena laboratory, Skopje, Macedonia

Background-aim

Exposure to pesticides both occupationally and environmentally causes a range of human health problems, ranging from simple irritation of the skin and eyes to more severe effects.

The aim of this study was to evaluate the association between chronic occupational pesticide exposure of orchard workers and changes in serum enzyme activities and serum concentration of some biochemical parameters: alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma glutamyl transferase

(GGT), alkaline phosphatase (ALP), acetylcholinesterase (AChE), creatine phosphokinase (CPK), total proteins, glucose and total bilirubin.

Methods

In the study were included 47 peach orchard workers, at the age from 19 to 60 years, with monthly exposure to pesticides from 5 to 20 days and 1 to 35 working years. The control group consisted of 40 healthy age-matched men, without exposure to pesticides. Orchard workers included in this study were exposed to methomyl, mancozeb and chlorpyrifos-cipermetrin. The pesticides were prepared in the way and in concentrations recommended by manufacturers and used for spaying only on open peach plantation. All orchard workers keep to safety precautions. All parameters were examined by using standard spectrophotometric assays.

Results

68% of examined workers reported some physical signs and symptoms. The significant decreased AChE activity was detected in 10.6% of orchard workers and increased CPK activity in 40.4%. Very weak negative correlation was detected between AChE and ALP activities ($r = -0.34$, $p = .001$) and between AChE and CPK activities ($r = -0.25$, $p = .02$) in workers occupational exposed to pesticides. No correlation was found between the serum AChE and day of monthly exposure, as well as years of exposure. The significant difference was detected for serum total protein, glucose and total bilirubin levels between control group and workers exposed to pesticides ($p < .05$). Very weak positive correlation was detected between serum AChE activity and serum total protein level ($r = 0.32$, $p = .003$) in orchard workers.

Conclusions

The results have shown that orchard workers with decreased AChE activity and increased ALP and CPK activity should be monitoring as workers with greatest risk for severe pesticide poisoning.

doi:10.1016/j.cca.2019.03.1584

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Effect of occupational lead exposure on serum zinc levels in factory workers of Rajasthan, India

T. Goyal, P. Mitra, S. Sharma, P. Sharma
All India Institute Of Medical Sciences, Jodhpur, India

Background-aim

Lead, a known carcinogen, induces physiological, biochemical and behavioural disturbances in humans. Exposure to this metal is unavoidable because of its accumulation in the environment and use in industrial applications. Although not fully elucidated, the main mechanism of action of Lead in mediating toxicity is oxidative stress. Lead interacts with several trace elements, one of which is Zinc. Zinc reduces lead-induced oxidative stress and competes with lead for similar binding sites. The ability of zinc to reduce lead absorption has been reported in animal model studies.

Methods

One hundred and thirteen factory workers were enrolled in this study. Blood Lead level was estimated by Graphite furnace-atomic absorption spectrophotometer. Serum zinc level was estimated by flame-atomic absorption spectrophotometer.

Results

The mean \pm SD levels of Lead was 4.32 ± 2.95 $\mu\text{g/dl}$ (range 0.1–17.6 $\mu\text{g/dl}$) while that of zinc was 0.37 ± 0.28 mg/L (range 0.01–1.2 mg/L). Serum zinc levels were less than normal reference range in the studied group. The differences among the lead and zinc levels were statistically significant ($p < .001$) with an inverse correlation.

Conclusions

Based on the obtained results, factory workers may be advised to take zinc supplementation to reduce the effects of lead induced damage. Further work is needed to evaluate the underlying mechanism.

doi:10.1016/j.cca.2019.03.1585

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Performance evaluation of the Emit II Plus oxycodone assay on the Siemens Viva-E and Beckman Coulter AU680 systems

B. Israel, A. Walters, D. Waggett, G. Siefring Jr
Siemens Healthcare Diagnostics Inc., Newark, DE, USA

Background-aim

Oxycodone is a semisynthetic opioid analgesic prescribed for the relief of moderate to severe pain. The Emit® II Plus Oxycodone Assay consists of ready-to-use liquid reagents that provide qualitative and semiquantitative results with cutoffs of 100 and 300 ng/mL . The data presented in this study was generated on the Siemens Viva-E® Drug Testing System and the Beckman Coulter AU680 System. Application protocols have also been developed for the Dimension, Dimension Vista, ADVIA Chemistry, and Atellica CH systems.

Methods

Precision was evaluated at the cutoffs, $\pm 25\%$ controls, and other levels according to CLSI EP5-A2. Analytical recovery was studied at levels that span the assay range (50–1000 ng/mL). Specimens (100 per cutoff) were analyzed and the results compared to LC-MS/MS and between the AU680 and Viva-E systems. Cross-reactivity with structurally-related drugs was assessed. The effect of common interferents was assessed in urine in the presence of oxycodone at levels of $\pm 25\%$ of the cutoffs.

Results

Evaluation of precision on the Viva-E and AU systems demonstrated qualitative repeatability CVs (rate) for all levels that ranged from 0.18 to 0.63%; within-lab CVs ranged from 0.41 to 1.32%. Semiquantitative repeatability CVs (ng/mL) ranged from 0.68 to 3.83%; within-lab CVs ranged from 2.38 to 8.87%. Semiquantitatively