3rd Regional TIAFT Meeting in Turkey

The International Association of Forensic Toxicologists

Drug Abuse & Crime Symposium

18-20 October 2018

Nevşehir Hacı Bektaş Veli University
Cappadocia, Nevşehir/TURKEY

BOOK OF ABSTRACTS

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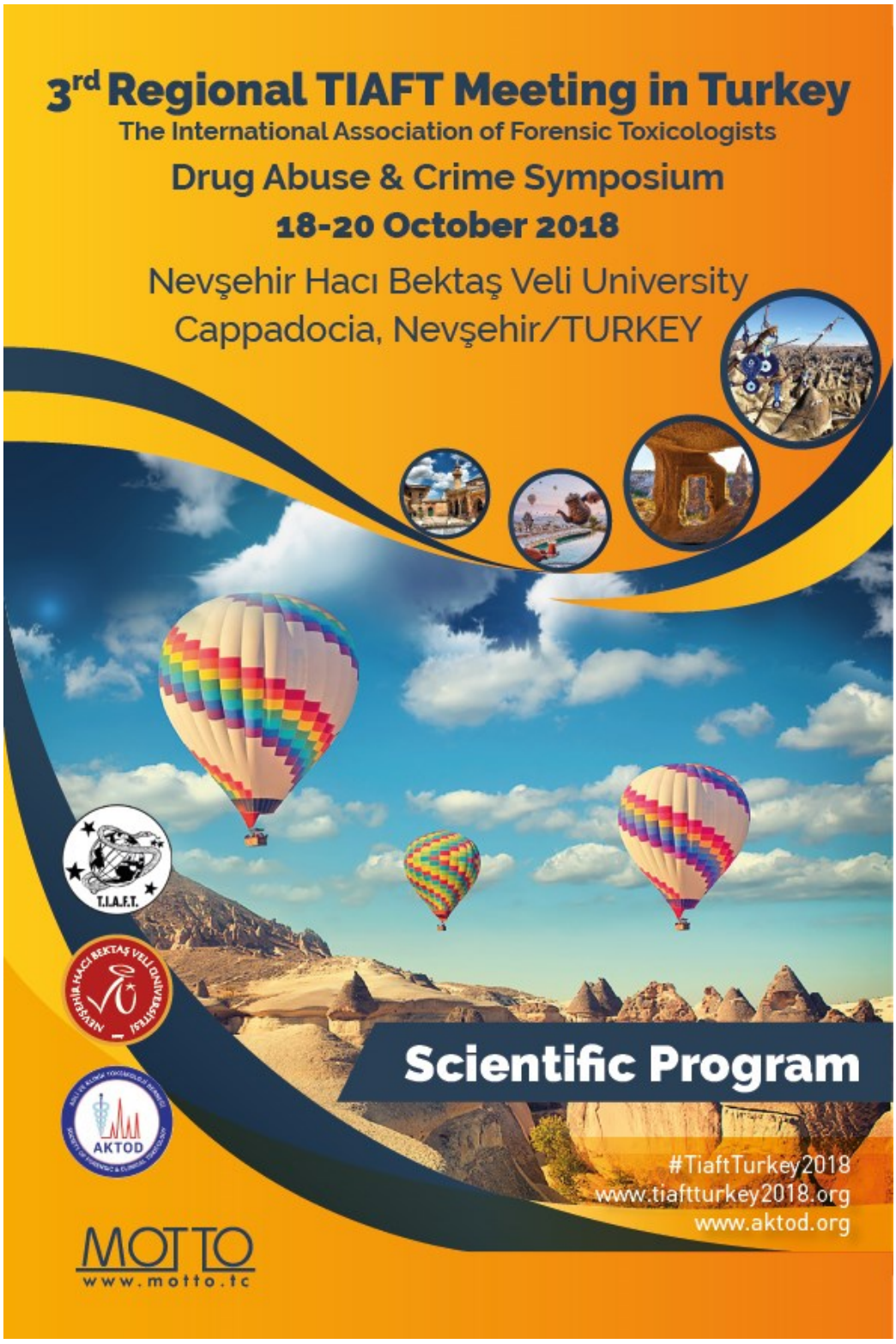
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Nevşehir Hacı Bektaş Veli University
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Scientific Program
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18th October 2018, Thursday

08:00-All day	**Registration**
09:00-11:00	**Workshops**
10:30-11:00	**Coffeebreak**
11:00-13:30	**Opening Ceremony** Chairs: Serap Annette Akgür, Nebile Dağlıoğlu Rector of Hacı Bektaş Veli University and protocol speeches **Opening Conference** Justice Tettey-Toxicology in International Drug Control **Turkish Traditional Program** Sevil Atasoy - A forensic toxicology journey in Turkey
13:30-14:30	**Lunch**
14:30-16:15	**Panel 1 : Anti-Drug Effort** Chairs: Serap Akgür, Justice Tettey **Nikolas P. Lemos** - Drugs and Organised Crime: A Global Challenge **Alberto Salomone** - Should the New Psychoactive Substances Be Included in Workplace Drug Testing? **Jose Restolho** - Drugs of Abuse in Portugal: An Overview **A represantative from TUBIM** **Questions**
16:15-16:30	**Coffeebreak**
16:30-18:30	**Panel 2 : Drug & Crime Prevention** Chairs:Nebile Dağlıoğlu, Marc Lebau **Marilyn Huestis** - The Great US Cannabis Experiment, Short and Long-term Consequences of Cannabis Medicalization and Commercialization **Nevşehir Police Department** **A represantative from KIHBI** **A represantative from Ministry of Justice** **Questions**
18:30-19:00	**1 - Oral Presentations (Local Language)** Chairs: Mehmet Tokdemir-Hülya Yükseloğlu O1- Hasan Yavuzer O2 - Hüseyin Dengiz O3- Ahmedi Cihangir İltaş

19th October 2018, Friday

09:00-09:45 — **Keynote Lecture - 1**

Marc Lebeau - Drug Facilitated Sexual Assaults: Setting Analytical Expectations to Improve Toxicological Investigations of DFSA

09:45-10:45 — **2 - Oral Presentations**
Chairs: Marc Lebau-Ersi Abacı Kalfoğlu
O4 - Jose Restolho
O5 - İffet İpek Boşgelmez
O6 - Evsen Yavuz Guzel
O7 - Ertuğrul Kaya
O8 - Fatma Nil Ertaş
O9 - Aslı Atasoy

10:45-11:15 — Coffeebreak - Poster&Vendor Session

11:15-12:00 — **Keynote Lecture - 2**

Heesun Chung - Interpretation of Forensic Toxicological Results – The Effect of Putrefaction

12:00-13:00 — **3 - Oral Presentations**
Chairs: Heesun Chung-Mukaddes Gürler
O10 - Rukiye Döğer
O11 - Ali Yurtseven
O12 - Hülya Karadeniz
O13 - İsmail Ethem Gören
O14 - Melike Aydoğdu

13:00-14:00 — Lunch

14:00-14:45 — **Keynote Lecture - 3**

Donata Favretto - Interpretation Challenges of Hair Analysis

14:45-15:45 — **4 - Oral Presentations**
Chairs: Donata Favretto- Yeşim Tunçok
O15 - Görkem Yararbaş
O16 - Sabriye Kocatürk Sel
O17 - Fatma Dilek Şeker
O18 - Şule Kara
O19 - İnci Derya Yücel

15:45-16:15 — Coffeebreak - Poster&Vendor Session

16:15-16:35 — **Marc Devaux** - Scopolamine Poisson : From the Plants of the Gods to the Devil's Breath

16:35-17:30 — **5 - Oral Presentations**
Chairs: Marc Devaux- Mine Kadıoğlu Duman
O20 - Kadir Daştan
O21 - Deniz Günaştı Cantutumlu
O22 - Duygu Yeşim Karabulut
O23 - Yiğit İltaş
O24 - Murat Akbaba

20.00 — Gala Dinner

20th October 2018, Saturday

08:30-10:30 **Keynote Lecture - 4**

Marilyn Huestis - NPS Lecture on Pharmacology and Adverse Events

10:30-11:30 **6 - Oral Presentations**
Chairs: Marilyn Huestis-Zafer Gören
O25 - Mukaddes Gürler
O26 - Orhan Şahin
O27 - Yakup Gülekçi
O28 - Cenk Nuri Coşkun
O29 - İsmail Yılmaz
O30 - Özge Güner

11:30-11:45 **Coffeebreak - Poster&Vendor Session**

11:45-12:30 **Keynote Lecture - 5**

Nikolas Lemos - Future Perspective in Forensic Toxicology: Education

12:30-12:50 **Ashraf Mozayani** - Proficiency testing Why? What? When? Where? and How?

12:50-13:30 **Lunch**

13:30-17:00 **Social Programme in Cappadocia**

Workshops

POSTMORTEM TOXICOLOGY RESULTS EVALUATING AND REPORTING PROCEDURES

ANALYTIC METHODS IN FORENSIC TOXICOLOGY

Oral Presentations

18th October 2018 · 17:30-19:30

O1- Social Factors Which Effects The Start Of Using Drug And Becoming Addicted
Hasan Yavuzer

O2- Prevalence Of Ethyl Glucuronide (Etg), Ethyl Sulphate Among Patients Injured When Driving
Hüseyin Dengiz

O3- Consideration Of Drug Addiction Within The Scope Of The Various Provisions In Turkish Civil Law With Regard To The Family Law
Ahmedi Cihangir İltaş

19th October 2018 · 09:45-10:45

O4- Determination Of Amphetamines-Type Stimulants In Urine Samples Using Microextraction By Packed Sorbent And Gas Chromatography-Mass Spectrometry
Jose Restolho

O5- Food Forensics: A Glimpse Of Elemental Contents Of Herbal Teas-Preliminary Data
İffet İpek Boşgelmez

O6- The Occurrence And Seasonal Variations Of Cocaine And Its Main Metabolite Benzoylecgonine, In Seyhan River, Turkey
Evsen Yavuz Güzel

O7- Comparing In Methodology Of Synthetic Canabinoid Analysis Performed In Duzce University Pharmacology Laboratory
Ertuğrul Kaya

O8- Development Of Polymeric SPME Fibers Modified With Carbon Nanomaterials For Pesticide Determination In Fruit Juices By GC-MS
Fatma Nil Ertaş

O9- Multi-Residue Analysis Of Selected New Psychoactive Substances In Wastewater Samples By Liquid Chromatography–Tandem Mass Spectrometry
Aslı Atasoy

19th October 2018 · 12:00-13:00

O10- Multiple Drug Use Profile In Izmir Turkey
Rukiye Döğer

O11- Frequency Of Illicit Drugs Among Adolescents Presenting To The Emergency Department
Ali Yurtseven

O12- Evaluation Of Cases Using Marijuana Between 2011-2015 Years In Trabzon,Turkey
Hülya Karadeniz

O13- Multiple Organ Failure Associated With Ecstascy: A Pediatric Case
İsmail Ethem Gören

O14- Urinary Drug Screening Test Results And Creatinine Normalization Standards
Melike Aydoğdu

19th October 2018 · 14:45-15:45

O15- Relationship Between Nicotine Doses And Flavour Preferences İn E-Cigarette Users
Görkem Yararbaş

O16- In The İnterpretation Of The Results Of Forensic Toxicological Analysis İn Drug Abusers, The Significance Of Cytochrome P450 Polymorphisms Genotyping
Sabriye Kocatürk Sel

O17- Examination Of İnternalized Stigmatization And Shame-Guilt

Feelings On The Prisoners With A History Of Alcohol And Substance Abuse
Fatma Dilek Şeker

O18- Relationship Between Nicotine Addiction Scores And Smoking Duration Of Patients Who Applied To Smoking Cessation Clinic
Şule Kara

O19- Determination of Difficulties in The Rehabilitation Practices on Drug

19th October 2018 · 16:35-18:00

O20- 1,4-Butanedıol Traffıckıng And Abuse In Turkey
Kadir Daştan

O21- The Sale Rıght And Legal Lıabılıtıes Of Pharmacısts On The Sales Of Drugs
Deniz Günaştı Cantutumlu

O22- Determination Of Breath Alcohol Concentration After Using Mouthwash Products
Duygu Yeşim Karabulut

O23- The Crıme Of Facılıtatıng The Use Of Drug Or Stımulant Substances In Turkısh Penal Code
Yiğit İltaş

O24- Medicolegal Approach To A Body Packer Case
Murat Akbaba

20th October 2018 · 09:45-10:45

O25- Determining Of Abused Drugs İn Patients Admitted To Pediatric Emergency Service By Using Validated Method On LC-MS/MS
Mukaddes Gürler

O26- Evaluation Of Cardiovascular Drug Poisonings Reported To The Dokuz Eylul University Drug And Poison Information Center Between 2014 And 2017
Orhan Şahin

O27- Comparison Of Factors Affecting The Development Of Latent Fingerprints In Crime Scenes In Terms Of Surface Types
Yakup Gülekçi

O28- Determınatıon Of The Maın Toxıns Of Major Poısoned Mushrooms Wıth Single Method Of Lc-Ms / Ms
Cenk Nuri Coşkun

O29- Effects Of Erdosteine On Beta Amanitin-İnduced Hepatotoxicity On Human C3A Hepatocyte Cell Line
İsmail Yılmaz

O30- Does Every Plant Have Healıng Propertıes?
Özge Güner

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WORKSHOP ABSTRACTS

W-1 POSTMORTEM TOXICOLOGY RESULTS EVALUATING AND REPORTING PROCEDURES

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Forensic toxicology draws on knowledge of analytical chemistry, pharmacology, medicine, forensic science and criminal justice and provides information to the legal system on the effects and role of drugs and poisons in a case. Post-mortem (PM) forensic toxicology determines the absence or presence of drugs and their metabolites, chemicals such as ethanol and other volatile substances, carbon monoxide and other gases, metals, and other toxic chemicals in human fluids and tissues and evaluates their role as a determinant or contributory factor in the cause and manner of death. There are greater variety of specimens such as brain, liver, muscle, fat, bile, hair, larvae of insects and typically, blood, vitreous humour and urine in post-mortem analysis. PM results should be interpreted with as much history and caution as possible because of each case may present itself differently. Many factors affect interpretation especially body preservation (i.e. state of decomposition), extent of trauma thus influencing potential blood choice, sample collection technique at autopsy, potential for post-mortem redistribution, lipophilic nature of analytes and extensive distribution into the tissue and type of collection tubes and storage conditions. Post-mortem redistribution means that the change of drug concentrations between the time of death and specimen collection, usually due to diffusion from an area of high concentration to one of lower concentration with subsequent movement of fluids within the body. Net change is a function of multiple factors in post-mortem redistribution (PMR) such as pharmacokinetic properties of the drug, chemical characteristics of the drug, orientation of the body, putrefaction, drug dosage etc. The human body is not a static entity after death so PMR must be taken into account when engaging in PM forensic toxicology.

W-2 ANALYTICAL METHOD DEVELOPMENT IN FORENSIC TOXICOLOGY

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Forensic toxicology is the application of toxicological analysis in cases and issues where the results are likely to be used in court. Since, utilizing an accurate, sensitive and selective analytical method is very crucial for the inspection of criminal cases, it is important to make correct choices in each step of the analysis. Method development includes several steps which are very important for the reliability of the analytical method such as sample matrix selection, sample preparation and/or preconcentration, analytical measurement and data handling and evaluation. This draft provides an outlook for the opportunities to develop an analytical method for the forensic toxicology.

Keywords: Method Development, Sample Treatment, Liquid Chromatography

KEYNOTE ABSTRACTS

REPORTS OF ADVERSE EVENTS ASSOCIATED WITH USE OF NOVEL PSYCHOACTIVE SUBSTANCES, 2013–2016: A REVIEW

Barry K. Logan[1,2], Amanda L.A. Mohr[1], Melissa Friscia[1], Alex J. Krotulski[1], Donna M. Papsun[2], Sherri L. Kacinko[2], Jeri D. Ropero-Miller[3], Marilyn A. Huestis[1,2]

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Novel psychoactive substances (NPS) represent significant analytical and interpretive challenges to forensic and clinical toxicologists. Timely access to case reports and reports of adverse incidents of impairment or toxicity is imperative to clinical diagnosis and treatment, as well as to interpretation of forensic results. Delays in identifying the presence of a novel intoxicating agent have significant consequences for public health and public safety. Adverse effects of intoxications with novel cannabinoids, stimulants, hallucinogens, benzodiazepines and opioids spanning January 2013 through December 2016 as reported in emergency departments, death investigations, impaired driving cases and other forensic contexts are the subject of this review. Discussion of the chemistry, pharmacology and adverse events associated with novel drug classes is summarized and described within. Adverse effects or symptoms associated with ingestion of more than 45 NPS have been abstracted and summarized in tables, including demographics, case history, clinical or behavioral symptoms, autopsy findings and drug confirmations with quantitative results when provided. Based on these findings and gaps in the available data, we provide recommendations for future toxicological testing of these evolving substances. These include development and management of a national monitoring program to provide real-time clinical and toxicological data, confirmed analytically, on emerging drugs and their known toxidromes and side effect profiles. Increased efforts should be made to analytically confirm the agents responsible for clinical intoxications involving adverse events in emergency department admissions or hospitalizations. Evidence-based community preparedness among analytical laboratories gained through active communication and sharing of toxicological findings and trends in NPS is imperative.

Journal of Analytical Toxicology, 2017;41:573–610

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SHOULD THE NPS BE INCLUDED IN WORKPLACE DRUG TESTING?

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Nowadays, the consumption of NPS is proliferating at an unprecedented rate and poses a significant risk to the public health and a challenge to national and international drug policies. Two possible scenarios are likely to account for the intake of NPS by the individuals, and specifically those involved in regular (urine) testing, for instance within the procedures for workplace drug testing (WDT). The first one suggests that certain classes of drug consumers will be deliberately induced to substitute the "old" drugs with the new synthetic substances, as long as these new classes of compounds are not routinely screened. The second motivation often recalled for NPS use is their novelty: a large variety of new products has been suddenly offered to the public, often stimulating the curiosity to test and compare different effects and sensations. The frequent renewal of the NPS offered on the black market prevented up to now the implementation of affordable analytical procedures and governmental policies to contrast the NPS phenomenon. However, a series of new elements may modify this perspective in the forthcoming years. In particular, more stable and revisable wide-ranging analytical procedures are progressively developed and made available to detect the intake of NPS, whatever their origin had been (i.e., voluntary or unaware). As a matter of fact, several laboratories are currently offering screening and confirmation analysis for NPS in the context of workplace drug testing, driving re-licensing, roadside control and withdrawal programs. If implemented, workplace NPS testing would likely enjoy the dual benefit from the deterrent effect on the workforce and the monitoring of the phenomenon in different times and Countries, eventually supporting the employee and providing pathways into help and treatment. A dose of caution is certainly recommended (and necessary) to avoid the indiscriminate criminalization of NPS use. Nevertheless, these substances (if not all, most of them) may represent a serious threat to the employers health and the construction of a safe workplace.

SCOPOLAMINE POISSON: FROM THE PLANTS OF THE GODS TO THE DEVIL'S BREATH

Marc DEVEAUX[1], Olivier LEPENNETIER[2], Frédéric BAUD[2], Marjorie CHEZE[1], Guillaume HOIZEY[1]
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Introduction: Numerous Solanaceae plants, particularly species of Hyoscyamus, Atropa, Mandragora, Datura and Brugmansia are known since many thousand years to give hallucinogenic effects These "plants of the gods" contain tropan alkaloids, mainly scopolamine, atropine and hyoscyamine. Moreover few OTC medications containing scopolamine are marketed. Scopolamine is also available on the internet. Scopolamine exerts anticholinergic effects as dry mucous membranes, thirst, flushed skin, mydriasis, as well as CNS depression, with sedation, confusion, agitation, hallucinations, amnesia, seizure and coma. To describe examples of scopolamine accidental poisonings due to recreational use of plant material, accidental consumption of contaminated food or street drugs, and malicious administration.

Method: Description of criminal cases in which our forensic laboratory was involved.

Results and discussion: When consuming Datura herbal tea or seeds, the scopolamine toxicity is indirect, due to the hallucinogenic effect leading to perform impulsive and dangerous things. Accidental poisonings after consumption of 5-6 pancakes made with buckwheat flour occurred when the buckwheat seeds, are polluted with jimsonweed seeds (scopolamine 0.0014%). Urine scopolamine concentration was 0.5 ng/mL in one case. A threshold is now established for tropan alkaloids in cereal in UE. An episode of poisoning by cocaine contaminated by scopolamine (50-70 mg/dose) occurred in Paris. Scopolamine blood concentrations were in the range 7-25 ng/mL. We developed a strong collaboration between clinical and forensic toxicologists to better observe this kind of short toxic epidemic. The last two examples are the recent use of "devil's breath" administered surreptitiously in order to commit robbery. A spray contained scopolamine was pulverized in the face of the victim or a tissue impregnated with scopolamine was rubbed on his nose. Four hours after inhalation, blood scopolamine concentrations were 1.2 and 7 ng/mL, urine scopolamine concentrations were 217 and 510 ng/mL. Conclusion: Use of scopolamine is now developed in Europe for DFC . As the concentrations in blood are in the ng/mL range, LC-MS/MS methods are highly recommended. Clinical and analytical toxicologists have to work in close co-operation to help investigations, and it has been shown that scopolamine can be easily detected in hair if no other samples are available.

ORAL PRESENTATION ABSTRACT

O-01 SOCIAL FACTORS WHICH AFFECTS THE START OF USING DRUG AND BECOMING ADDICTED

Hasan Yavuzer[1], Kutlay Yağmur Sarıçiçek[2], Ali Ağkoç[2]

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In recent years it's observed that drug use increases each passing day and this situation is perceived in our city, region, and country and around the world. This study explores the social factors, such as family, peer influence, residence, school and educational background, occupation/job and income status, on the start of using drug and being addicted that are one of the most important problem in the world. A field research will be done regarding this issue. It'll be conducted a questionnaire on drug users who have police and court investigation. The application phase will be in cooperation with the Directorate of Anti-Narcotics Crime Branch and Directorate of Probation in Nevşehir city-center. The data obtained, specific to the factors which effects drug use and being addicted, will be analyzed with the sociological point of view.

O-02 PREVALENCE OF ETHYL GLUCURONIDE (ETG), ETHYL SULPHATE AMONG PATIENTS INJURED WHEN DRIVING

Hüseyin Dengiz[1], Nebile Daglioglu[2], Alperay Girisbay[2]
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Introduction: Driving under the influence (DUI) of alcohol is the most important cause of traffic accidents. In many countries, legal limits for traffic have been determined in terms of blood alcohol concentration (BAC). The Turkish traffic law fixed value is 0.5 mg / dL in our country. Since the detection times of the ethanol is very short, it is necessary to take the blood sample immediately after the accident. However, the blood samples may not be taken immediately after the accident, depending on the suitability of the incident, the health conditions of transportation and injury. An alternative way to assess the possible role of ethanol in traffic accidents is to examine alcohol metabolites in people who are involved in an accident. Ethyl Glucuronide (EtG) and Ethyl Sulfate (EtS) from ethanol direct metabolites can be preferred due to the relatively longer detection time to ethanol. BAC, EtG, EtS concentrations should be determined and interpreted in the blood samples of 154 injured patients who applied to the emergency service after the traffic accident.

Method: Blood samples from patients admitted for treatment of injuries at a Cukurova emergency department were tested for alcohol. BAC was determined by direct injection into the HS-GC-FID (LOQ:10 mg/dL) system. To determine EtG and EtS, blood samples were subjected to liquid-liquid extraction after protein precipitation applied to LC-MS/ MS system.

Results: 154 injured patients who were admitted < 12 h after injury were included in the study. The mean age of the patients injured was 33 years. 21 % of the patients were positive for BAC, EtG and EtS. 60% of the patients were negative for BAC, EtG and EtS. BAC was negative in 19% of patients while, EtG and/or EtS were positive.

Conclusion: BAC, EtG, EtS concentrations and blood collection time were assessed to determine the amount of ethanol at the accident. According to our study results, there was a significant correlation between BAC, EtG and EtS concentrations in some samples. In addition to BAC, the identification of EtG and EtS will give more accurate information about the amount of alcohol in the accident.

Anahtar Kelimeler: BAC, DUI, Kan EtG, Kan EtS, Trafik Kazaları

O-03 ONSIDERATION OF DRUG ADDICTION WITHIN THE SCOPE OF THE VARIOUS PROVISIONS IN TURKISH CIVIL LAW WITH REGARD TO THE FAMILY LAW

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Drug use and addiction, which adversely affect the individual's power of discernment, as well as his ability to steer and control his behaviors, have become one of the ever-escalating problems we have often been coming by in the social life recently. Drug addiction, which makes the one's integration to the social life difficult, jeopardizes his economic future, and brings along adverse effects onto his self-care and self-control, may cause it necessary to bring about restrictions against the addicts within the frame of Turkish Civil Law for the sake of saving the lives of the addicts. On the other hand, drug addiction has adverse effects not only on the addicted people himself, but also on his family life. Dealing with the drug addiction comprehensively with regard to the engagements, marriages, divorces, and right to custody processes being carried out in the field of family law within the scope of Turkish Civil Law is therefore quite critical for avoiding the loss of rights of not only the addicts themselves, but also their families. This study is intended to discuss the drug addiction in view of both the addicts and their families within the scope of the provisions stipulated in Turkish Civil Law regarding such processes as limitation, engagement, marriage, divorce, and right to custody, and in consideration of the judicial discretion of the judges in relation with the aforementioned provisions.

O-04 DETERMINATION OF AMPHETAMINES-TYPE STIMULANTS IN URINE SAMPLES USING MICROEXTRACTION BY PACKED SORBENT AND GAS CHROMATOGRAPHY-MASS SPECTROMETRY

Sara Malaca[1], Tiago Rosado[1], Jose Restolho[2], Jesus Rodilla[3], Lucia Silva[3], Cláudia Margalho[4], Mário Barroso[5], Eugénia Gallardo[1]

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Microextraction by packed sorbent (MEPS) is a new technique adapted from the conventional solid-phase extraction (SPE), where in this recent format it is possible to work with a minor scale of sample volumes. The major advantages of this method are the reduced volume of both organic solvents and sample, as well as the possibility of reusing the extraction cartridge without carryover. The aim of this research project was the development, optimization, and validation of an analytical method using microextraction by packed sorbent and gas chromatography-mass spectrometry to determine 3,4-methylenedioxiethylamphetamine (MDA), amphetamine, methamphetamine, methylenedioxiethylmethamphetamine (MDMA), 3,4-methilenedioxi-N-methil-α-ethylfeniletilamine (MBDB), and 3,4-methilenedioxietilamphetamine (MDEA) in urine samples. In this study seven different techniques were compared in order to optimize the extraction process by testing different solvents in order to increase the efficiency and obtain lower detection limits using only 200 µL of sample. Several factors were studied (the type of support, sample dilution, washing solution, solvents of elution, and strokes). The method was validated according to the Food and Drug Administration (FDA) and the Scientific Working Group of Forensic Toxicology (SGWTOX) for the validation of bioanalytical methods. The method proved to be linear in the range of 25 (35)-1000 ng/mL with coefficients of determination greater than 0.99 for all analytes. Intra-and inter-day accuracy and precision were in accordance with the above-mentioned criteria, presenting coefficients of variation of less than 15% and BIAS within a range of ± 15% of the theoretical concentration. This technique revealed to be a promissory alternative for the quantification of these drugs of abuse in urine samples due to the fast extraction process (only 3 minutes), significant reduction of sample volume (200 µL) when compared to conventional SPE, reduction of organic solvents consumption, possibility of reusing the column (more than

50 extractions are possible, depending on the type of sample) and adequate recoveries (30-89%). This project was funded by FEDER funds through POCI-COMPETE 2020 – Operational Programme Competitivity and Internationalization, on their Eixo I – Reinforcement of investigation, from technologic development and innovation (Project POCI-01-0145-FEDER-007491) and with National Funds by FCT – Foundation for Science and Technology (Project UID/Multi/00709/2013).

O-05 FOOD FORENSICS: A GLIMPSE OF ELEMENTAL CONTENTS OF HERBAL TEAS-PRELIMINARY DATA

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Complementary and alternative medicines have been in focus for thousands of years, and nowadays, use of herbal products has been tremendously increasing worldwide. Exposure may result in toxicity esp. in higher concentrations of metals, since these are invisible to consumers who assume that these products are totally natural and beneficial. Herbal products may be contaminated with toxic elements when they are planted in soils polluted by either natural sources, or through pesticides or industrial emissions. Moreover, processing and storage conditions may contribute to higher metal concentrations. In this study, our aim was to contribute to the product safety issue in a "food forensics" frame. Here, we report our preliminary results of a study on elemental composition of 3-sets of herbal teas including samples for (1)winter ailments, as well as so-called (2)"slimming or form teas" and (3)other mixed-herbal teas including lactating-mother formulas. The samples presented herein were selected with regard to their potential consumption rates. A total of 16 different samples in groups of herbal tea bags namely winter (n=5), form (n=5) and mixed-herbal tea blends (n=6) were evaluated simultaneously for aluminum(Al), manganese(Mn), nickel(Ni), cadmium(Cd), and lead(Pb) contents. Concentrations of elements were determined using ICP-MS which has become the method-of-choice in multi-element analysis, with its low detection limit, wide linear-dynamic range. Our findings have shown that some herbal tea samples contained higher levels of Al(samples:#4,8,14), Ni (samples:#2,11,15), Mn(samples:#3,6,15), and Pb(samples:#3,8,12) as compared with other samples. Interestingly, Cd levels in samples were undetectable. Group-based comparison revealed that contents of Al, Mn, and Ni in mixed-herbal blends were higher as compared with those of winter and form tea samples; whereas Pb concentrations were slightly elevated in winter tea samples. Therefore, current data supports importance of regulation and monitoring of herbal preparations as highlighted previously.

Key words: Food forensics, Herbal tea, ICP-MS, Metals

O-06 THE OCCURRENCE AND SEASONAL VARIATIONS OF COCAINE AND ITS MAIN METABOLITE BENZOYLECGONINE, IN SEYHAN RIVER, TURKEY

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Introduction: Illicit drugs and metabolites have been accepted as environmental emerging pollutants in recent years. Following consumption, illicit drugs and their metabolites are continuously released into the aquatic environment because of their partial elimination in wastewater treatment plants (WWTPs) and, according to their physico-chemical properties. Only 1–9% of a cocaine dose is excreted in urine unchanged, while 35–54% is excreted as benzoylecgonine. Unlike cocaine, its main metabolite benzoylecgonine has high stability under various conditions in the environment. Determination of these compounds in the environment is an indirect tool to estimate the community level consumption of cocaine and to evaluate potential eco-toxicological impacts.

Method: In this study, regional and seasonal variations of cocaine and benzoylecgonine were detected in Seyhan River. 7 stations were chosen between the exit of Seyhan Dam Lake and entering of the Mediterranean Sea. Surface water samples were taken over the periods of December 2016 to November 2017. Solid phase extraction and a sensitive liquid chromatography-tandem mass spectrometry (LC-MS/MS) screening method were used for the analysis of benzoylecgonine.

Results & Conclusion: Cocaine was detected at any seasons and stations, while benzoylecgonine was detected in 36% of the studied samples. Benzoylecgonine concentrations were between 0.16-0.50 ng/L. The highest concentrations were detected in the SEY-06 station which is under the effect of WWTPs effluents of Adana Province. Benzoylecgonine concentrations were higher in the summer season. Although concentrations were not very high, they can potentially impact the human health and ecosystem functioning.

Keywords: Illicit drugs, cocaine, benzoylecgonine, Seyhan River, LC-MS/MS

O-07 COMPARING IN METHODOLOGY OF SYNTHETIC CANABINOID ANALYSIS PERFORMED IN DUZCE UNIVERSITY PHARMACOLOGY LABORATORY

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Introduction: The use of drugs is one of the most important problems threatening public health worldwide and in our country. In this study we aimed to compare the analysing methods of the prohibited substances. By examining the data obtained in our laboratory; the differences between analysing methods, such as Lc-MS / MS and immunoassay, especially in synthetic cannabinoid assays, have been revealed. We hope these data will be able to shed light on which methods may be more useful in terms of synthetic cannabinoid analysis. **Methods:** Data in this study were obtained from forensic toxicology analysis performed in Duzce University Medical Pharmacology Laboratory in 2016 and 2017. The results of synthetic cannabinoid analysis of urine specimens from individuals sent by the forensic institutions were compared by liquid chromatography-mass spectrometry (LC-MS / MS) and enzyme immunoassay (autoanalyser) methods. 40 different synthetic cannabinoids and metabolites were analyzed. Different analytical methods were compared with kappa statistics. **Results:** Samples taken from 440 individuals, 422 men (95.90%) and 18 women (4.10%) were analyzed in 2016 and 2017. Median age was 30,65 (±9,68; 13-74). For all prohibited substances, 145 positive (32.95%) and 295 negative (67.05%) results were found. A total of 51 positive (11.59%) (K1: 1; K2: 2; K3: 48) and 389 negative (88.41%) results were found for the synthetic cannabinoid in both methods. 184 (41.82%) individuals reported usage of synthetic cannabinoid in the past week.
Discussion: Within the individuals applied to our laboratory, we determined male population is significantly higher. The positivity rate in analysis results of non-synthetic cannabinoid prohibited substances are significantly higher than synthetic cannabinoids. All positive and negative results obtained for the K1 and K2 synthetic cannabinoid groups are fully compatible with enzyme immunoassay and LC-MS / MS methods. Total positive and negative results for the K3 synthetic cannabinoid group are the same; 18 results are incompatible among the devices, all other positive and negative results are compatible (moderate fit). Compatibility between devices for all three synthetic cannabinoid groups was statistically significant. There is an inconsistency between the individuals' statements about the usage of synthetic cannabinoids and the results with both analysis methods.

O-08 DEVELOPMENT OF POLYMERIC SPME FIBERS MODIFIED WITH CARBON NANOMATERIALS FOR PESTICIDE DETERMINATION IN FRUIT JUICES BY GC-MS

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Introduction: Pesticides are widely used in agricultural production and due to their harmful effects for the environment and human health; accurate and reliable analytical methods are required for their analysis. Present study describes the development of solid-phase microextraction (SPME) fibers for the determination of selected pesticides used in grape and apple juices prior to the GC-MS analysis.

Method: The SPME fiber was synthesized by using a stainless steel wire dipped into a cell containing the monomer, pyrrole in particular, and carbon nanomaterials where it was subjected to electropolymerization by cycling the potential in a range of -0.5 - 2.0 V. The graphene (Gr), multiwall carbon nanotubes (MWCNT) and fullerenes have been used for this purpose. Fiber surfaces have been characterized by SEM measurements and then, the fibers have been used in head space (HS) or direct immersion mode for volatile and non-volatile pesticides, respectively. After a predetermined extraction time, the fiber was introduced into the GC-MS system where the analysis was performed in SIM mode.

Results & Conclusion: Operational parameters affecting the extraction efficiency such as the medium pH, adsorption and desorption time and temperature have been optimized. Analytical characteristics of the method have been investigated and it was revealed that these pesticides can be determined in ppb level with high recovery percentages well below the MRL values, without any solvent consumption or labor intensive pre-treatment processes.

Keywords: pesticide residue analysis, SPME, GC-MS, polypyrrole, carbon nanomaterials

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O-09 MULTI-RESIDUE ANALYSIS OF SELECTED NEW PSYCHOACTIVE SUBSTANCES IN WASTEWATER SAMPLES BY LIQUID CHROMATOGRAPHY–TANDEM MASS SPECTROMETRY-A PRIMARILY STUDY

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Introduction: The use of new psychoactive substances (NPSs) has become increasingly popular in recent years. Analysis of these substances in wastewaters can be used to monitor their use in communities. However, constantly increasing numbers and changing structures make it difficult to predict the true size of consumption. Wastewater based epidemiology (WBE) analysis can provide this information by analyzing the metabolic residues of these substances and their metabolites in urban wastewater.

Method: With the objective to improve the knowledge on the use of NPS, a rapid and sensitive method was developed and validated for the determination of 69 priority NPSs and their metabolites. This study presents an analytical methodology based on solid phase extraction (SPE) and liquid chromatography-tandem mass spectrometry (LC-MS/MS) for the determination of NPSs in wastewater. Synthetic cathinones, cannabinoids, and tryptamines are included among the target analytes. The optimized analysis conditions of this set of compounds included a SPE clean-up step by using different sorbents and the use of a specific chromatographic column. Isotopically labelled internal standards are used to correct for matrix effects and potential SPE losses.

Results & Conclusion: Despite the broad range of physicochemical properties of the NPSs the method allowed acceptable recoveries for all the studied compounds at different concentration levels.

Keywords: New psychoactive substances (NPSs), multi-residue analysis, wastewater, LC-MS/MS

O-10 MULTIPLE DRUG USE PROFILE IN IZMIR/TURKEY

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Introduction: Multiple drug (MD) use among people is great concern globally given the associated substantial physical and mental health problems. Although multiple drug abuse often refers to abuse of multiple illicit drugs, it's also inclusive of prescription medications used in nonmedical circumstances. The purpose of this study was to determine the frequency of illegal substance and multiple drug use by evaluating toxicological results of the cases who were admitted to Addiction Toxicology Laboratory.

Methods: Urine samples of 14.122 cases who admitted from probation system and various departments of hospital analyzed by enzymatic immunoassay between 2016-2017. Urine samples were analyzed for cannabis, amphetamine type stimulants (ATS), cocaine, opiates, benzodiazepine, buprenorphine and synthetic cannabinoids. Toxicological analysis results of the cases were obtained from hospital automation system and data were analyzed statistically.

Results: 30,2% (n=4265) of the total cases (n=14122) were positive. 49,14% (n = 2096) of the drug positive cases were from probation and 50,86% (n=2169) were from clinical cases. Single drug was detected 81% (n=3453) of the positive cases and multidrug was detected in 19% (n=812). When we look at the distribution in years, the most positive case is in March.The most commonly detected drug in probation and clinical cases is cannabis. Multiple drug was detected in 17,13% (n=359) of probation cases and 20,88% (n=453) of clinical cases. When MD combinations were considered, the most common drugs were cannabis with ATS in probation cases and opiate with buprenorphine were detected in clinical cases. MD was detected in 19,6% (n=444) of the positive cases in 2016 while in 2017 this rate was 18,4% (n=368) and no significant difference was found between them (p=0.244).

Conclusion: The use of several drugs by an individual over a longer period of time might reflect the replacement of one drug by another, due to changes in price, availability, legality or fashion. Because of the most commonly detected drugs and involved in MD combinations, it is given rise to though that cannabis and ATS may be a step in the transition to MD. Increasing of multi drug use is the issue to be emphasized.

Keywords: Multiple drug use, Toxicology, Drug analysis

O-11 FREQUENCY OF ILLICIT DRUGS AMONG ADOLESCENTS PRESENTING TO THE EMERGENCY DEPARTMENT

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Introduction: Drug-related visits to emergency departments (ED) have continued to increase in recent years. We aimed to determine the frequency of substance abuse among adolescents who presented to our ED. We also tried to identify clinical and socio economic characteristics of the adolescents.

Methods: We conducted a retrospective study of all adolescents, presenting to our emergency department (ED) with complaints related to recreational drug use and having a positive urine drug screening from January, 2013 to December 2016. To minimize the missing data, a telephone interview was done by the first author. Baseline demographic data (age, gender) and clinical data (admission date, cause of presentation) were obtained.

Results: During the study period urine toxicology screen was positive for illicit drugs in 131 (0.9%) patients. A total of 144 illicit drugs were detected in these patiens. The total of substance users by years were respectively 17 (13%) in 2013, 27 (20%) in 2014, 39 (30%) in 2015 and 48 (37%). The median age was 16 years and 65% were male. Majority of substance users (61%) had neuropsychiatric complaint. Amphetamine/metamphetamine (60%) was the most commonly used substance. Rate of cigarette and alcohol use in this adolescent group was respectively 95% and 88%. This group also had some specific features such as low income (59%) and single-parent family (54%).

Conclusion: The number of illicit drug use has been steadily increasing among adolescent. The most common identified substance was amphetamine/metamphetamine. They had poor socioeconomic conditions

O-12 EVALUATION OF CASES USING MARIJUANA BETWEEN 2011-2015 YEARS IN TRABZON, TURKEY

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Increase is observed in recent years in the use of marijuana in our country. The aim of this study was to determine the presence of marijuana and drug abuse in the East of Black Sea Region during five year period. A retrospective evaluation was made of 2446 cases sent to the Chemistry Department of Trabzon Branch of the Council of Forensic Medicine by the surrounding province Prosecutor's Office because of drug use between 1 January 2011 and 31 December 2015 years. Cases were evaluated in respect of age, gender, level of education, occupation, and the type of drug used. Blood and urine specimens were analysed by Enzyme Immunoassay (CEDIA) and Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS). Of 2446 cases determined with marijuana use, 2389 (97.7%) were male and 57 (2.3%) were female. The mean age was 29.3±9.3 years in the males and 23.7±7.2 years in the females. The prevalence of cannabis use was higher in male than female. The age ranges of the males were 509(21.3%) cases in the 13-22 years age group, 975(40.8%) cases in the 23-32 years group, 474 (19.8%) cases in the 33-42 years group, 285(11.9%) cases in the 43-52 years group, and 146 (6.1%) cases in the 53-62≥ years age group. The females were found to be 20(35.1%) cases in the 13-22 years age group and 35(61.4%) cases in the 23-32 years age group, and 2(3.5%) in the 33-42 years group. While marijuana were determined in 2052 cases,ıt was determined together with other substances (synthetic cannabinoids, ecstasy, heroin, cocaine, benzodiazepine, anti-depressants, anti-psychotics) in 394 cases. According to the results of the current study, it can be said that marijuana use is widespread among males, and the majority were adolescents or young adults. Combating addictive substances and drug use is a priority problem pending today. This study, in accordance with the literature, shows that substance use is a serious problem affecting especially the young population.

Keywords: Marijuana, abuse, drug, toxicology

O-13 MULTIPLE ORGAN FAILURE ASSOCIATED WITH ECSTASCY: A PEDIATRIC CASE

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Introduction: MDMA (3,4-methylenedioxymeth amphetamine), which is known as Ecstasy or Molly is being more frequently used worldwide by specifically young people at parties and festivals. This synthetic compound has effects of enjoyment sense, feeling more energetic and loss of time perception. Cases of multiple organ failure and mortality are recorded more frequently. In this case, we present a pediatric patient who developed multiple organ failure due to Ecstasy intake.

Case: A 11-years-old male patient was brought to hospital due to loss of consciousness. It was learned that the patient was Ecstasy addictive and took an unknown amount of tablets on that morning. The patient was intubated at the emergency room and after inotropes were started he was delivered to the pediatric intensive care unit due to central nervous system depression; heart, liver and kidney failure resulting from Ecstasy intake. Artery tension was normal with Dopamin, dobutamin and adrenalin infusion. Continuous venovenous hemodiafiltration was applied to the patient for 6 hours. The patient was extubated on the 12th hour. Inotrope treatment of the patient was quit on the third day of hospitalization. On day 4, fresh frozen plasma support was quit as the coagulation tests of the patient turned normal. N-acetyl cysteine was quit on day 6 and the patient was discharged from the intensive care unit to be returned for follow-up. Full blood count, liver and kidney functions were within normal limits when the patient came for control after 1 month. Blood and urine samples were examined at the Çukurova University Medicine Faculty Forensic Toxicology Laboratories with the Randox® (Ireland) pre-screening test and MDMA was found positive. Blood concentration was MDA: 9.8 ng/ml and MDMA: 39.7 ng/ml, respectively. Drug screening in the urine sample was conducted with the LC-MS/MS device, MDA and MDMA were found positive.

Conclusions: Emergency care and intensive care physicians should be careful about the side effects of MDMA intake. Toxicological analysis demand should be done routinely and extracorporeal treatments like hemodiafiltration should be taken into consideration.

Key Words: child, ecstasy, multiple organ failure, toxicology

O-14 URINARY SCREENING TEST RESULTS AND CREATININE NORMALIZATION STANDARDS

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Background & Objectives: Creatinine is a metabolic waste product that is formed from creatine and creatine phosphate in muscle and excreted by the kidneys. Urinary creatinine concentration serves as an indicator of urine dilution and it has to be analyzed with beside the drug panels. To avoid false negative results, different mathematical methods are used, including creatinine and drug screening test results. We aimed to choose the most appropriate method to prevent false negativity by examining the values obtained drug screening test results by immunoassay studies.

Methods: In this study, all cases that applied to our laboratory urine drug screening analysis results of were examined their reports between 2015-2017. Urine samples creatinine values were considered to be diluted between 5-20 mg/dL. Screening analysis for THC-COOH, amphetamine, ecstasy, opiate, benzodiazepine, cocaine and synthetic cannabinoids (JWH-018, JWH-073, AM-2201, UR-144) results were analysed beside the creatinine. False negativity rates were evaluated using linear models with different creatinine values for normalization.

Results: 18.692 cases urine screening results were investigated and mean creatinine value was calculated 146,45±87,37 mg/dL (Median:138,0 mg/dL).However, when the annual average of each year is evaluated separately, 153,00±87,584 (2015), 151,00±85,584 (2016), 134,74±77,627 (2017). The urine creatinine level of 553 cases was found between 5-20 mg/dL and reported as diluted. When creatinine values of these cases were normalized to the mean value, it was determined that 157 results were false negatives. 71,34% (N=112) THC-COOH, 21,65% (N=22) amphetamine and derivatives, 3,18% (N=5) opiate, 3,18% (N=5) synthetic cannabinoids, %0,63 (N=1) benzodiazepine were found positive.

Conclusion: One of the models used for normalization is the linear model. However, how should the average creatinine value that should be included in the formula be calculated, and what should the results be normalized to? The average creatinine values obtained vary from year to year and the rate of false negative/positive changes. Although there is no current standard range of spot urine average creatinine value for Turkey.

O-15 RELATIONSHIP BETWEEN NICOTINE DOSES AND FLAVOUR PREFERENCES IN E-CIGARETTE USERS

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Introduction: E-cigarettes are getting popular in the world. The number of e-cigarette users are also increasing in Turkey. There are several e-liquids with different nicotine doses and a large variety of flavours. Purpose: The aim of this study is to determine sociodemographic characteristics of Turkish e-cigarette users and investigate the relationship between nicotine doses of e-liquids they use and flavour preferences.

Method: A web based questionnaire was applied to the participants. 585 users of electronic cigarettes participated in the study. Of the 585 participants, 96.6% (n=572) were men and 2.2% (n = 13) were women. Survey data includes socio-demographic information and vaping habits.

Results: E-cigarette users' flavour preferences and nicotine dose groups were compared by using one-factor analysis of variance. There is a significant difference between the flavour preference and the nicotine dose they use ($p<0.001$). When multiple comparisons were made in the posthoc analysis, users who prefer tobacco flavour differ significantly in nicotine dose level from users who prefer fruit and pastry flavour. There is a significant difference between fruity flavour preferring users and no flavour preferring users in terms of nicotine doses.

Conclusion: Although e-cigarettes are marketed as an alternative smoking cessation method, many users are using these products as a new addictive substance. Our results show that higher nicotine dose preferring individuals are also preferring tobacco flavour or no flavour products. On the other hand there is another group of users who prefer fruit and pastry flavours with relatively lower doses of nicotine. User preferences should be further investigated in order to develop more effective preventive methods against e-cigarette use.

O-16 THE INTERPRETATION OF THE RESULTS OF FORENSIC TOXICOLOGICAL ANALYSIS IN DRUG ABUSERS, THE SIGNIFICANCE OF CYTOCHROME P450 POLYMORPHISMS GENOTYPING

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Introduction: Abuse of drugs is associated with numerous medical, social, and legal problems. Drug abuse can be defined as an inappropriate use of a drug for a nonmedical purpose. Drugs of abuse are associated with a variety of side effects, which are range from mild to serious. 'Drugs of abuse' testing is therefore an important task in forensic toxicology and related fields like pharmacogenetic. The cytochrome P450 (CYP) superfamily is the most important Phase I drug metabolizing enzymes that oxidize a number of endogenous compounds and xenobiotics, including more than 90% of current therapeutic drugs. All CYPs are subject to inhibition while most CYPs are subject to induction and genetic mutations play an important role in the enzyme activity variation of many CYPs, in particular CYP2C9, 2C19, and 2D6. The aim of this study is to evaluate CYP2D6 and CYP2C9 enzyme polymorphisms in drug abusers.

Method: The blood samples were prepared using solid phase extraction afterwards injected to LC-MS/MS. The genetic analysis were performed employing TagMan drug metabolism genotyping assay kit (TaqMan® DME Genotyping Assays ID : C_32407232_50, C_32407243_20 ThermoFisher Scientific) by Real Time PCR.

Results: The results of the genetic results obtained are still in the evaluation stage. By now the genotype frequencies of CYP2D6*3 (A2549del), and CYP2D6*6 (T1707del) yielded no significant results for subjects compared to control groups.

Conclusions: Inter-individual genetic variation in drug responses may cause therapeutic failure or toxicity. The application of pharmacogenetic in forensic toxicology may provide a rational basis for the understanding of various drug-related fatalities.

O-17 EXAMINATION OF INTERNALIZED STIGMATIZATION AND SHAME-GUILT FEELINGS ON THE PRISONERS WITH A HISTORY OF ALCOHOL AND SUBSTANCE ABUSE

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Many studies have shown that the internalized stigma is high in people with alcohol and substance abuse. The main purpose of this study is to examine internalized stigmatization and shame-guilt feelings on the prisoners with a history of alcohol and substance abuse. The volunteer subjects with and without alcohol and substance abuse problems in this study were examined for ways of internalized stigmatization, guilt and shame feelings and socio-demographic variables. The study group includes 102 males with alcohol and substance abuse problem between 19-63 years old among the prisoners of Menemen T-Type prison and also control group 48 males without alcohol and substance abuse problem randomly selected from between prison inmate. The subjects were provided with the Guilt and Shame Scale (GSS) and the Internalized Stigma of Mental Illness (ISMI) Scale in addition to the Personal Information Form. As a result of this study, guilt and shame feelings of the individuals of control group were found to be considerably higher than study group. Prevalence of using alcohol (71.6%), cannabis (64.7%), ecstasy (28.4%), inhalant (16.7%), cocaine (12.7%), crack cocaine (11.8%), rohypnol (9.8%), methamphetamine (9.8%), akineton (8.8%), heroin (8.8%) and LSD (6.9%) among with alcohol and substance abuse prison inmates. A statistically significant difference was found between the mean scores of prison inmates with and without alcohol and substance abuse from the Guilt and Shame Scale ($p<0,05$). There was no significant relation between guilt, shame and internalized stigma scale scores of prison inmates with alcohol and substance abuse problems. There was a significant difference between prison inmates with psychiatric diagnoses and without psychiatric diagnoses among study group for the internalized stigma scale ($p<0,05$). In addition, prison inmates with psychiatric diagnoses have higher internalized stigma scores. Result of the study is discussed in light of the relevant literature. The study is important being the first in this area in Turkey. For future studies, it is suggested to increase the number of samples for better investigate the relationship between perceptions of guilt-shame feelings and stigma in prisoners with alcohol and substance use.

O-18 RELATIONSHIP BETWEEN NICOTINE ADDICTION SCORES AND SMOKING DURATION OF PATIENTS WHO APPLIED TO SMOKING CESSATION CLINIC

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Introduction: Smoking is the most common form of tobacco use worldwide and is one of the most common causes of death in the world. In order to avoid cigarette use, it is important to investigate the relationship between nicotine addiction and users' characteristics well. The aim of this study is to establish the relationship between the socio-demographic characteristics of the patients who applied to the smoking cessation clinic and the duration of smoking and the nicotine addiction scores.

Method: Between January 2018 and June 2018, 377 people who applied to the Ege University Institute on Drug Abuse, Toxicology and Pharmaceutical Science Smoking Cessation Clinic were included in this retrospective study. Of the 377 people included in the study, 138 (36.5%) were women, 239 (63.5%) were men, mean age was 39.4 ± 12.1. Patients were divided into 3 groups according to their total duration of smoking. For statistical analysis, SPSS V24 program was used.

Results: It was found that groups formed according to addiction level and duration of smoking had a significant difference when compared with one-factor analysis of variance (p=.002). In addition to these findings, addiction scores of participants did not differ significantly according to age to start smoking, gender or marital status.

Conclusions: The results show that smoking addiction scores are lower in the first years of cigarette smoking and the addiction is strengthened as the number of smoking years increases. This result indicates that new approaches are needed in order to help smokers for earlier quit attempts for better quit rates.

Key words: smoking cessation, smoking addiction

O-19 DETERMINATION OF DIFFICULTIES IN THE REHABILITATION PRACTICES ON DRUG USER PROBATIONERS AND PROBATION OFFICERS-EXAMPLE OF IZMIR CITY

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Background & Objectives: In accordance with the Article: 191 of the Turkish Penal Code, it is a criminal offense to buy, accept or hold to use drugs or stimulants. As an alternative to criminal sanction, a treatment and probation measure is prescribed for drug users. Probation staffs (probation experts/officers) have difficulties in areas such as job stress, job satisfaction, personal accomplishment, communication skills with drug user probationers in probation system in Turkey. Burnout is a common psychological syndrome in "helping" professions such as probation staff and it is a result of long-term stress which includes emotional burnout, depersonalization and personal accomplishment reduction and they can affect to performance of probation staff in rehabilitation programmes, so it is needed to develop new models and/or upgrade training modules for probation staff. On the other hand drug user probationers (offenders under probation service) need innovative rehabilitation models due to their variable characteristics and needs. The purpose of this study is to determine the difficulties experienced by probation staff and probationers with substance use disorder during rehabilitation in probation service, thus; to recommend making the program better functioning.

Methods: "Survey of Evaluating Probation Service for Probationers", "Addiction Profile Index (API)", "Multidimensional Scale of Perceived Social Support" and "Personal Information Form" will be applied to 200 drug user probationers. "Job Stress Scale", "Minnesota Job Satisfaction Scale", "Maslach Burnout Inventory (MBI)", "Inventory of Communication Skills" and "Survey of Evaluating Drug User Probationers for Probation Staff" will be applied to 70 probation staff in Izmir Probation Directorate. For statistical analysis, SPSS V24 program will be used.

Results & Conclusion: It is aimed that evaluating drug user probationers' features of addiction and related to probation(perceived self-development, satisfaction of probation service) will contribute to determine needs for developing new rehabilitation models in probation services, consequently it can contribute to improve current rehabilitation models or/and develop innovative methodologies, researches in relevant studies in the future. Also the determining probation staff's levels of job satisfaction, emotional burnout, depersonalization, perceived

individual job success and communication skills will contribute to understand how to structure new models of trainings for professions in probation staff in the future.

O-20 1,4-BUTANEDIOL TRAFFICKING AND ABUSE IN TURKEY

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Introduction: Gamma-hydroxybutyric acid (GHB) and its precursor gamma-hydroxybutyrolactone (GBL) is used as an alternative to ecstasy due to their euphoric arousal effects. They are also abused by amphetamine abusers to "turn off" and get a relaxing sleep. Both substances are highly addictive and are currently classified as illicit drugs in many countries. In turn, those are difficult to reach in domestic markets since they are strictly under control by customs and narcotics agents. As a precursor of GHB, 1,4-butanediol (1,4- BD) has an increasing problematic use in Turkey. 1,4-BD has the potential to produce a state of dependence, and can produce similar psychotropic effects as GHB as it is readily converted to GHB upon its ingestion. To date, the illicit distribution of 1,4-BD did not appear to be as prevalent as that of GHB. Because of the limited direct data with 1,4-BD itself, expressions of the nature and magnitude of public health problems related to its abuse and dependence was speculative. However, it is now evident that the drug users who cannot obtain GHB are abusing 1,4-BD as it is still not under control and can easily be purchased even from domestic manufacturers. This study aims to create awareness and inform the authorities to take measures for this trafficking.

Method: In this study, a detailed literature review has been carried out to understand the current legal legislations in different countries and raise the awareness of competent authorities.

Results: The pharmacologic and toxicologic responses to this chemical are due to its metabolic conversion to GHB. GHB is controlled as a narcotic drug in Turkey but 1,4-BD is still not. The great danger with it is that the difference between the desired dose and an overdose which can be sometimes lethal is so small.

Conclusion: It is known that deaths have been reported in different countries after such abuse. Unfortunately, there is still no clinically effective antidote available and it is easy to manufacture and obtain. In conclusion, the illicit use and trade of 1,4-BD should be prevented and controlled due to its toxic and highly addictive potential.

Keywords: 1,4-Butanediol, Abuse, Trafficking, Controlled Substances, Toxic, Addiction

O-21 THE SALE RIGHT AND LEGAL LIABILITIES OF PHARMACISTS ON THE SALES OF DRUGS

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Drug abuse, especially those affecting the young population, is an important problem for our country as it is in many countries around the world. In addition to being a sociological problem, it is accepted as a universal crime in many countries. Only the extent of this crime, its scope and the proportion of punishment given may vary from country to country. Therefore, many countries have been making arrangements to prevent this abuse and prevent it from emerging. Turkey also has been fighting with this problem and this crime through international contracts of the United Nations and at the same time internal laws through codes, decrees, regulations, ordinances and general affairs. In the fight against drug offenses, the legislators have more duties and responsibilities on certain occupational groups, especially those working in the health field. One of these groups are pharmacists who have the right to access, maintain and sell these drugs may cause the effects of drugs and stimulants and therefore are frequently abused. However, the use of these legal rights also has limitations and certain rules. These limits have been established in the laws, regulations, rules relating to the pharmacy profession and Turkish Criminal Code. As a result of contradictions to these limitations, the pharmacist's not only administrative but also criminal liability may arise. The topic of this study aims to emphasize the criminal liability of a pharmacist’s for over-the-counter sales of prescription drugs that may cause drug or stimulant effects, which are evaluated by in the scope of drug production and traffic.

O-22 DETERMINATION OF BREATH ALCOHOL CONCENTRATION AFTER USING MOUTHWASH PRODUCTS

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Introduction: Alcohol is a chemical that is frequently encountered in moisturizers, cleansers or tonics. Due to the physicochemical properties of alcohol, the products formulated using alcohol are preferred as raw materials by the producers because they are lightweight, easy to release and the feeling they leave on the skin is refreshing. Mouthwashes are used frequently to improve personal oral care or suggested by dentists for mouth health. In order to improve antibacterial activity, some mouthwashes contain ethanol (MCE) and it has recently been a problem for drivers. A variety of mouthwashes and soft drinks were tested and found to contain low concentrations of alcohol. It is well known that alcohol is retained in the mouth for a short period following consumption of alcoholic beverages or following use of alcohol-containing breath sprays or mouth washes. The aim of this study was to evaluate the concentration of breath alcohol by alcoholmeter after use of personal care products containing alcohol.

Methods: Ten physically and psychologically healthy volunteers (7F / 3M) were selected in the 18-45 age range and the body mass index was in the normal range. Two different mouthwashes and a mouth spray were used in the study. Breath alcohol measurements were taken from each volunteer before using these products. Alcohol concentrations in the breaths of the volunteers were measured using the breathing-alcohol analyzer (Lifeloc FC20 Alcoholmeter) after using these products at certain intervals.

Results: In our country, commercial vehicle drivers and public service drivers are completely banned from the traffic with alcohol. For other drivers, 0.50 Promile has been determined as a legal limit, equal to half a gram of alcohol in one liter of blood. The results obtained in 5 minutes following the use of personal care products, which are frequently used as amouthwash products in daily life, were found to be above the 0.5 promil limit according to Article 97 of Road Traffic Regulation No. 2918. After the use of mouth spray. the results were found to be above the legal limit in the first minutes.

Conclusion: After the use of personal care products in this preliminary study, alcohol concentrations were obtained according to the results of the tests performed in the breath, close to the legal limit accepted in our country. This suggests that the alcohol detected in the patient's breath was determined by oral alcohol intake. If people claim that they do not drink alcohol, a measurement is required after waiting for a certain period of time. In this way, both the innocence of the person emerged and the legal criminal procedures to avoid dealing with. It is the determination of alcohol in the blood in terms of accuracy and reliability.

Keywords: Alcohol, Alcoholmeter, Mouthwash, Mouthsprey, Breath, Breath Alcohol

O-23 THE CRIME OF FACILITATING THE USE OF DRUG OR STIMULANT SUBSTANCES IN TURKISH PENAL CODE

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The drug or stimulant substances, illegal and uncontrolled use of which has been increasingly expanding worldwide, also constitute a public health problem due to threatening the health and safety of not only the individuals, but also of the society that the individuals live in. The advancements in the fields of technology and transportation, and the facilities they bring along, as well as the decline in the age of starting to take drug or stimulant substances have altogether caused the countries insert provisions banning not only the illegal use of drug or stimulant substances, but also the manufacturing and trading of the same, and take any measure necessary in order to escalate the applicability of the said provisions. In terms of fighting against the drug and stimulant substances, Turkish Penal Code includes provisions that ban not only the illegal use of, as well as making available, buying, and receiving drug and stimulant substances for use, but also those that ban the manufacturing and trading of the drug and stimulant substances. In addition to the foregoing legal regulations, the Article No.190 of Turkish Penal Code, titled "facilitating the use of drug or stimulant substances", provides for the penalization of the persons, who provide location, equipment or materials in order to facilitate others' use of drug or stimulant substances, take measures that may make it difficult to arrest the users thereof, inform others about the methods of using the same, and who either explicitly tempt, or make broadcasts explicitly tempting the use of the said drug or stimulant substances. It is intended in this study to bring about an in-depth discussion regarding the Article 190 of Turkish Penal Code on the crime of facilitating the use of drug or stimulant substances, as well as the offenders/victims, material/moral elements, and the specific aspects of the crime.

O-24 MEDICOLEGAL APPROACH TO A BODY PACKER CASE

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Introduction: The method to carry drugs and stimulants by hiding them within the body is referred to as body packing. It was first described in 1973 with a 21-year old patient who developed small bowel obstruction 13 days after swallowing a condom containing hashish. The medicolegal approach to the patients who were taken into custody by the police and asked if they carried narcotics in their body as well as various challenges that were encountered will be addressed.

Materials and Methods: A male patient who was brought by the law enforcement officers to determine whether he had drugs in his rectum was examined and the packages were removed after radiological and toxicological examinations.

Results: 4 days before the patient was brought to us, he had been taken to the emergency department by law enforcement officers due to his inane and aggressive behavior, and there were no pathological findings in his brain CT taken with the preliminary diagnosis of acute psychosis. His urinary toxicology screening performed in the emergency department was positive for amphetamine, methamphetamine, benzodiazepine, opiate and 3,4-Methylenedioxymethamphetamine metabolites. It was understood that he was discharged after his clinical presentation improved during follow-up in the emergency department. The patient refused to provide history and anamnesis during the interview with the patient accompanied by a translator. The patient underwent direct radiography and abdominal CT after he was provided with the necessary information and gave his informed consent. His direct radiography did not show any foreign object images, whereas his abdominal CT revealed 3 foreign objects with nodular appearance in his rectum. After consultation with the gastroenterology department, one of the foreign objects was removed with a snare during rectosigmoidoscopy. The removed package was assessed as Type 1 according to McCarron and Wood classification. Considering the fact that this type of package is at a high risk of rupturing as well as the localization of packages, it was recommended to monitor the patient and use repeated enemas. However, the patient refused treatment and left the hospital. **Conclusion:** Body packing should always be included among the diagnoses for patients who present to the emergency department with a poor general condition, behavior disorder that cannot be explained by organic causes and symptoms that imply intoxication besides having a history of recent foreign travel. Primarily

conducting a urinary toxicology screening in these patients, who generally refuse to provide anamnesis, is of significant importance in making a diagnosis. Presence of a package should be investigated using advanced imaging techniques if multiple substance positivity is detected in toxicology screening. Possible complications should be considered during the follow-up of the patient. In cases that legal authorities request all packages to be removed and the patient refuses treatment, the patient's state of consciousness should be considered while taking an action and patient rights should not be ignored.

Keywords: Body packing, Rectosigmoidoscopy

O-25 DETERMINING OF ABUSED DRUGS IN PATIENTS ADMITTED TO PEDIATRIC EMERGENCY SERVICE BY USING VALIDATED METHOD ON LC-MS/MS

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The ever-increasing use of drugs in childhood is a major social and health problem that causes serious illnesses and deaths in adolescents. Especially the increasing tendency to the synthetic drugs, is a growing danger, because of their easy availability, unknown ingredients, clinical sequela and uncontrollably use. In our country, there is a paucity of information with regard to the prevalence of abused drugs related with urgent health problems in childhood. Current data revealing the general substance profile, include the data from AMATEMs (Treatment and Research Center for Alcohol and Drug Addicts), police narcotic departments (captured subtances), or the Council of Forensic Medicine (autopsies). To obtain concrete data on substance use profile in childhood or adolescents associated with emergency, we aimed to conduct a prospective study with quantitative analyzes in blood and urine specimens of pediatric patients, by using an advanced chromatographic technique (LC-MS/MS) with a validated method. Blood and urine samples were collected from 25 patients. Validated analytical methods have been developed covering a total of 39 substances and metabolites, including synthetic cannabinoids, synthetic cathinones, opiates, amphetamines, cannabis, and cocaine. The mean age of patients was 15,9 (10-17) with seven girls (28%), and 18 boys (72%). In 14 (56%) of them, which of 71.4% (n = 10) were male and 28.5% (n = 4) were female, we found positive results for drugs. The common substances detected were amphetamines (most common ecstasy), synthetic cathinones (a-PVP and methedron), cocaine (BEG), codeine (codeine-3-glucuronide) and cannabis (THC-COOH) respectively. Synthetic cannabinoids were below the LOD levels. Morphine and heroin were not detected in the samples. Ecstasy (MDMA), cocaine, and cathinones (mainly referred as new psychoactive substances) respectively were most frequent drugs related with urgent health problems in children or adolescents.

O-26 EVALUATION OF CARDIOVASCULAR DRUG POISONINGS REPORTED TO THE DOKUZ EYLUL UNIVERSITY DRUG AND POISON INFORMATION CENTER BETWEEN 2014 AND 2017

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Introduction: Cardiovascular drugs (CVDs) are frequently used for cardiovascular diseases such as hypertension, arrhythmia, angina and heart failure. The widespread use and prescribing of these drugs may lead to severe clinical problems also includes acute poisoning and death. Purpose: The purpose of our study is to reveal the demographic features, route and reason for exposure, clinical effects and outcome of cardiovascular drug poisonings reported to Dokuz Eylul University Drug and Poison Information Center (DEUDPIC) between January 2014 and December 2017.

Method: This retrospective, descriptive, and cross-sectional study was approved by the Noninvasive Research Ethics Committee of Dokuz Eylül University School of Medicine. All data were recorded on standard data forms and then transferred to a software (Ruber, written by Engin Yildiztepe, 2007) for data analysis.

Results: There were 43 poisonings cases were reported with CVDs. Mean age were 14.60±3.16 and 44.97±3.14 for children and adults, respectively. There was a female's predominance (60.47%). Half of the poisoning cases were graded as toxic (51.16%). Intentional exposure was the most common reason of poisonings (81.40%). All of cases between 13-49 age groups were intentional exposures. Only single substance intakes were responsible for the most of the drug exposures (62.79%). The most common agents were beta-blockers (29.85%), agents acting on the renin-angiotensin system (23.88%) and calcium channel blockers (11.94%) and cardiac therapy drugs such as digoxin (11.94%). Clinical signs and symptoms were categorized as asymptomatic (37.21%), mild (23.26%), moderate (23.26%), and severe (4.65%). Recommended treatments included observation and supportive care (46.67%), decontamination methods (44.00%) and antidote therapy (2.67%). One fatality was reported.

Conclusions: We believe that determination of the epidemiological characteristics of CVDs exposures in our country through prospectively multi-centered studies may provide significant contributions to prevent poisonings and decrease the mortality and morbidity of the cases.

O-27 COMPARISON OF FACTORS AFFECTING THE DEVELOPMENT OF LATENT FINGERPRINTS IN CRIME SCENES IN TERMS OF SURFACE TYPES

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Introduction: The purpose of this study is to investigate the effects of fingerprints on the findings of different surface types obtained from the crime scene investigation based on time, temperature, humidity, water, age, sex, contact and contamination effects and to determine whether fingerprints can be developed within the laboratory environments.

Methods: The fingerprints were placed on a variety of surfaces such as microscope slides of glass, galvanized sheet of metal, plank of raw wood, A4-A5 paper, mica for plastic and transparent vegetable bag for nylon at ten second intervals. Finger prints; Seven tests were performed at different times for 1 day, 1 week, 1 month, 3 months, 6 months, 9 months, and 12 months in both air and water environments for time and water factor. For the temperature and time factor, five trials were performed in three-month periods, with 50 C^o, 100 C^o, 150 C^o, 200 C^o, 250 C^o, 300 C^o degree temperatures were applied for three minutes each. For moisture; three trials were conducted in six month periods within environments of 60%, 80% and 100% humidity. Fingerprint development was evaluated by placing the fingerprints on the surface types with three different pressure forces for the contact effect. Fingerprint research was carried out using gasoline, oil, oil based paint and blood for the contamination effect. A total of 2448 sampled fingerprints were used.

Results: Fingerprints on glass and metal surfaces were found to be more suitable for classification than paper, wood and plastic surfaces. It was determined that the development of the fingerprints was inversely proportional to the time - water environment and time - temperature factors. As the age of the samples increased, fingerprint quality deteriorated and fingerprints of male subjects were found to be better than female individuals. In addition, it has been determined that the increase of the contamination rate on the surface with contact force negatively affects the fingerprint development.

Conclusion: Fingerprints on glass, metal, and plastic surfaces were negatively affected by physical external factors such as friction, and were hardly affected on paper and raw wood surfaces that had absorbent surface properties.

Keyword: Crime Scene, Fingerprint, Fingerprint Development Methods

O-28 DETERMINATION OF THE MAIN TOXINS OF MAJOR POISONED MUSHROOMS WITH SINGLE METHOD OF LC-MS/MS

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Introduction: Mushroom poisoning can be seen worldwide and in our country. Because of its devastating results it constitutes problems. Consumption of wild mushrooms is common in our country. Early intervention and detection are important because mushroom poisoning can be fatal even with small extents. There is still no method can detect all the mushroom poisons in a single method and device worldwide. Our aim is to develop a Liquid Chromatography-Mass Spectrometry (LC-MS / MS) method that can detect toxins which cause the most common mushroom poisoning in a single method quickly.

Methods: Standards for fatal toxin varieties were provided. Amatoxins and phallotoxins were collected and extracted from the natural environment of Amanita Phalloides type fungi, which contained the most fatal mushroom toxins. LC-MS/MS (Shimadzu Corp.) was used for the analysis of amatoxins and phallotoxins. Optimum conditions to achieve separation in the LC fraction were 50:m ammonium acetate (solvent A) containing fixed phase C18 column (250* 2,1 mm, 2.6μm) and mobile phase 0.1% formic acid and acetonitrile 90:10 : (A/B). After the system is stabilized at a flow rate of 1,2 ml/min and the column oven is set at 40°C and the metod takes 30 minutes in total with different gradients applied. Muscimol, Muscarine, Orellanine and Ibotenic acid toxins were determined under the same conditions; using the SIM (single ion monitoring) method in the LC-MS / MS system.

Results & Conclusion: As a result of our study, the retention times of amatoxins and phallotoxins in this gradient system, Alpha-amanitin: 13.0 min, Beta-amanitin: 12.6 min, Gamma-amanitin: 15.1, Phalloidin: 18.3 min, Phallacin: 17.2 min, Phallacidin: 17.6 min. Other toxins are detected by SIM method; Muscimol 20.6 min, Muscarine 8.6 min, İbotenic acid 2.3 min and Orellanine 17.07 min were determined. The results of this study indicates the major mushroom toxins; such as alpha amanitin, beta amanitin, gamma amanitin, phalloidin, phallacin, phallacidin, muscimol, muscarine, orellanine and ibotenic acid toxins could be detected in the single method.

O-29 EFFECTS OF ERDOSTEINE ON BETA AMANITIN-INDUCED HEPATOTOXICITY ON HUMAN C3A HEPATOCYTE CELL LINE

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Introduction: Alpha and beta-amanitin have been found more commonly than any other toxins in the Amanita mushrooms. The cytotoxic effects of beta-amanitin have been shown in a few studies. There is still no specific and fully efficient antidote for amatoxin poisoning. Erdosteine has been known to have protective effects on various tissues and liver in particular.

Purpose: The aim of this study was to investigate the possible beneficial effects of erdosteine in the prevention of beta-amanitin induced hepatotoxicity in a human C3A hepatocyte cell line.

Method: Beta-amanitin was purified from A. phalloides mushroom using the preparative HPLC method as described in the literature. Three hours after administering beta-amanitin in different concentrations (1,10,25 ve 50µg/mL) on the cells in a C3A human hepatocyte cell line, erdosteine was administered in various concentrations (1,10,50,100 and 250µg/mL). The MTT[3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide] test was used to determine cell viability.

Findings: While no toxicity was formed in 1µg/mL concentration of beta-amanitin provided in 1,10,25 and 50µg/mL concentrations in cell culture, 50µg/mL concentration annihilated cell viability entirely. 10 and 25µg/mL concentrations of beta-amanitin was found to decrease cell viability down to (a level of 88%, 69%, respectively) after 48 hours due to its toxic effect. When 10µg/mL was applied with beta-amanitin to the cell lines in which toxicity was composed with different erdosteine concentrations such as 1,10,50,100 and 250µg/mL, the cell viability rates obtained were as follows; respectively:136%,142%,143%,%137 and %120. In 25µg/mL beta-amanitin toxicity, however, cell viability rates were determined as 113%,107%,106% and 86%, respectively. Erdosteine significantly decreased toxicity formed with 10µg/mL beta-amanitin at all doses, it even increased cell viability more distinctly at low doses($p<0.01$). Nevertheless, it extinguished toxicity totally composed with 25µg/mL beta-amanitin at lower doses apparently, it relatively inhibited to a lower extent in 250µg/mL high dose while it was significant in control($p<0.01$).

Conclusions: Erdosteine may have protective effects for beta-amanitin induced hepatotoxicity. It entirely extinguished severe toxicity at no ultrahigh doses. Erdosteine raised cell viability at all doses in low toxicity, on the other hand, less at high doses. Finally, it may promise great hope as a new agent in treating amanitin-related mushroom poisonings.

O-30 DOES EVERY PLANT HAVE HEALING PROPERTIES?

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Introduction: The use of plants for treatment is increasing. Some of the reasons why patients choose herbal products are; it is thought to be more natural than drugs, less side effects, easier accessibility and being cheaper. However, the reliability and purity of these products are unknown. We visited herbalists located in two districts of Izmir and we introduced ourselves as first-class students of the Faculty of Medicine of DEU, we aimed to learn which plants were bought by people who are shopping from herbalists. Then we have learned by investigating the harms of these plants.

Material and method: We visited 30 herbalists, 25 of them which are willing to share information with us, gave information about plants/herbal products they sell.

Results: It was detected that most sold herbal products were; ginger, tillia, winter tea, curcuma, green tea, cherry stalk, nigella sativa, sexual power-boosting paste (epimedium paste, mesir paste, royal jelly, honey, pollen mixture etc.), chamomila, salvia, melissa, rose hip, fennel, clove, thyme, cinnamon, black pepper, lavender. It was also observed that H.perforatum, moringa tea, flaxseed and elaterium are sold. According to the information we have received, the most common reasons for women to buy herbal products are; weight loss, hair care, flu, skin care and spices for meals and for men; weakness, increasing sexual power and finding a solution to alopecia. In our search literature we learned that the rinse and ricinoleic acid contained in castor oil seem to be irritating to the intestines, cause nausea and vomiting, cause excessive diarrhea, and cause to electrolyte loss. It has been observed that when only one to 30 seeds are ate; it can lead to mild and severe symptoms, including a fatal result.

Conclusion: As a result of the studies and literature search we conducted on herbalists about the purchased herbal products, it was revealed that plants were not innocent and could cause harmful effects. Some herbalist were selling plants which forbidden to sell. And they were not has information on this issue. It has also become clear that it is necessary to carry out studies for increasing the level of public awareness.

POSTER PRESENTATION ABSTRACTS

P-01 LC-MS/MS METHOD FOR THE ANALYSİS OF EXPLOSİVES RESİDUES ON REAL SAMPLES

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Introduction: Sensitive, rapid and inexpensive methods for explosive determination in samples of explosive debris and environmental samples (water, soil etc) are important in order to determine type of explosive substances used in explosion and to match with previous events are increasing. In this study, LC-APCI-MS-MS was used in order to determine trace amounts of widely used 18 explosives in soil.

Methods: The method was developed for qualitative determination purpose. No method was encountered in the literature regarding simultaneous determination of these substances in soil matrix. The cleavage products for TNT (trinitrotoluene), RDX (1,3,5-trinitroperhydro-1,3,5-triazine), HMX (cyclotetra methylene-tetranitramine), PETN (pentaerythritoltetranitrate), TETRYL (2,4,6-trinitrophenyl-N-metilnitramine), 2,6-DNT (2,6-dinitrotoluene), TMETN (trimethylolethane-trinitrate), DPA (Diphenylamin), EC (ethyl centralite), MC (methyl centralite), 4-Nitrodiphenylamine (4-nDPA), 2-Nitrodiphenylamine (2-nDPA), Hexanitrodiphenylamine (HND, Hexyl, Dipicrylamine), NG (Nitroglycerin), NTO (5-Nitro-2,4-dihydro-3H-1,2,4-triazol-3-on), HNS (Hexanitrostilbene), PYX (2,6-bis,bis(picrylamino)-3,5-dinitropyridine), N-nitrosodiphenylamine (N-nDPA) and Picric Acid (PA, 2,4,6 trinitrophenol) (which is used as internal standard) were investigated in MS/MS and the signals of m/z ratios were optimized. MS/MS parameters and chromatographic method were optimized through using a gradient ammonium chloride:methanol mobile system and C18 column. The samples were analyzed in LC–MS/MS with APCI negative ionization mode after a 30 min single-step extraction procedure.

Results: The applicability of the overall method was demonstrated by the analysis of real soil samples. Those samples were taken from crime scene between 2014 and 2016 years afterwards the terror attacks in İstanbul.

Conclusion: An economical, fast, easy, repeatable and selective method with low detection and quantification limit and high recovery was developed for the analysis of TNT, RDX, HMX, PETN, TETRYL, 2,6-DNT, TMETN, DPA, EC, MC, 4-NDPA, 2-NDPA, N-nDPA, HND, NG, NTO, HNS and PYX in soil by using LC-MS/MS with APCI ionization.

Keywords: LC-MS/MS, Explosives, Soil

P-02 EMERGING POTENTIAL OF MICROFLUIDIC CHIPS IN THE FIELD OF FORENSICS

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In recent years, as in many other fields, on-site detection of diverse analytes in forensics has started to gain more interest. In this vein, microfluidics evolved as an alternative and novel platform for the need in rapid and accurate determination of various substances including illicit drugs, DNA, explosives (or their residues) as well as in monitoring the post-mortem interval. As a substitute for standard or traditional tests/methods, microfluidic devices based on different analytical principles such as paper-based analytical devices or others coupled with colorimetric, fluorescent, electrochemical sensing or other detection methods have been developed and tested in real samples such as in detection of cocaine, and textile dye characterization from fibers. These devices may be of paramount importance in establishment of sensitive and specific tests, ready-to-use on-site, with their potential advantages as user-friendly, portable, inexpensive, and disposable tools in various scenes. Last but not least, the volume of sample required as well as reagents, generally in submicroliter amounts, also are of note and make microfluidic platforms a useful alternative to current procedures. In this study, we sought to summarize the fundamentals and importance of microfluidic systems and their emerging use in forensic studies with selected examples in literature.

Key words: microfluidics, forensics, drug testing, on-site detection

P-04 MEDROXYPROGESTERONE ACETATE EXPOSURE DURING PREGNANCY

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Introduction: Medroxyprogesterone acetate (MPA) is a synthetic derivative of progesterone which is often used in the treatment of secondary amenorrhea, endometriosis, contraception, etc. In some animal studies, genital (hypospadias, masculinization in females, feminization in males) and non-genital (limb defects, chromosomal abnormalities, spina bifida) congenital anomalies have been reported. In humans, it is suggested that MPA use in early pregnancy was not associated with non-genital malformations. However, conflicting data with regard to hypospadias are also available. In this study, we evaluated the outcomes of pregnant women exposed to MPA in terms of teratogenicity.

Methods: 79 pregnant women with an age range of 17-41 years who have been treated with MPA were consulted because of several gynecologic problems by Karadeniz Technical University Teratogenicity Information Service (TIS) between 2000-2017. We performed a risk assessment for the pregnant women by considering the additional risk factors. Postnatally, we have received delivery information of the infants and followed up their development.

Results: All women used MPA during first trimester of pregnancy; 76 by oral route (5-10 mg/day) and 3 by intramuscular route (150 mg). We could not contact 20 of these pregnant women. The outcomes of 59 pregnant women contacted are: 4 spontaneous abortions, 8 therapeutic abortions, one intrauterin exitus at 22th gestation week due to predisposition of thrombosis and one intrauterin exitus at 28th gestation week due to unknown reasons. Although 43 of the infants were healthy, one infant had hypothyroidism and one had minimal atrial septal defect (ASD)-ventricular septal defect (VSD).

Conclusions: In humans, it is reported that MPA increases the risk of perinatal mortality and low birth weight. In this study, six prenatal deaths are remarkable while compared to 43 healthy infants. Predisposition to thrombosis is one of the reasons of prenatal death and it should be noted that progesterone may contribute to thrombosis.

P-05 LEVETIRACETAM EXPOSURE DURING PREGNANCY

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Introduction: Nowadays, the inability of first generation antiepileptic drugs (AED) to control seizures in some patients and the side effects have led to the development of new antiepileptic drugs. Levetiracetam is a new generation of piracetam derivative medicine developed for this purpose and used in both partial and generalized type seizures with low interaction potential. LEV, the s-isomer of etiracetam, is marketed as Keppra for the treatment of seizure disorders. In preclinical studies presented in the product label, the incidence of growth restriction and minor skeletal abnormalities was increased in pregnant rats given LEV at a dose level similar to the human dose. LEV is a relatively new AED and, to date, more than 1000 pregnancies have been reported in eight prospective registries with various results. Malformation rates between these records range from 0% to 2.4%. We aimed to review the results of our pregnant women exposed to LEV.

Methods: 14 pregnant women with an age range of 19-43 years who have been treated with LEV were consulted because of several gynecologic problems by Karadeniz Technical University Teratogenicity Information Service (TIS) between 2000-2017. We performed a risk assessment for the pregnant women by considering the additional risk factors. Postnatally, we have received delivery information of the infants and followed up their development.

Results: 5 cases lost to follow-up were excluded. 7 of 9 women with LEV exposure delivered healthy babies. One women had spontaneous abortions. One fetus had anomaly that was detected at 5.5 months of gestation. The mother had used concomitantly valproic acid.

Conclusions: One congenital malformation was observed in infants exposed to LEV and valproic acid. It is thought that this anomaly probably is associated with valproic acid. The “safety” of LEV exposure in the first trimester should be confirmed with further investigations.

P-06 RETROSPECTIVE EVALUATION OF PREGNANT WOMEN CONSULTED BECAUSE OF DRUG EXPOSURE DURING PREGNANCY

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Introduction: Treatment may be necessary for diseases diagnosed during or before pregnancy. Most of drug use because of this reason is in early stages of pregnancy while mothers are often not aware of their pregnancy. The pregnant cases prescribed drugs in the primary or secondary health care units have been consulted by Karadeniz Technical University Teratogenicity Information Service (KTU-TIS) since 1999. After the review of the data available in the literature, obstetricians, other physicians and the families were informed about the risk levels proposed due to the drugs and obstetric history. Overall data were retrospectively reviewed and presented in this study.

Methods: Age, habituations, consanguineous marriage, Rh incompatibility, abortion history, X-ray, names of drugs, drug dosing and exposure periods were recorded and a risk assessment was performed. Gestation weeks were established with ultrasonography. The health status and development of newborns were followed up for a year.

Results: 3997 pregnant women (16-49 age) were consulted and followed up since 1999. 610 kinds of drugs were recorded. The most common drug groups were chemotherapeutics (96), drugs affecting central nervous system (94), drugs affecting gastrointestinal system (60), cardiovascular system drugs (58), analgesic/anti-inflammatory drugs (50), hormones (16), steroids (30). Pregnancies were resulted in 172 therapeutic abortions, 115 spontaneous abortions. 43 congenital abnormalities were observed among 1744 alive deliveries birth have been observed.

Conclusions: The pregnancy status or planning must be considered while prescribing especially to women of reproductive age. In case of prescribing to women who are not aware of pregnancy mainly in early stages, information and consultation of such cases by TIS has a critical and an important role especially for preventing curettage intervention clinically not needed. Better performance for TIS units is possible when such units are organized at a national level.

P-07 HYDROXYZINE EXPOSURE IN FIRST TRIMESTER

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Introduction: Hydroxyzine is a first-generation H1 receptor antagonist agent, which has indications as treatment of anxiety/agitation, pre-postoperative analgesia/anesthesia, pruritus and emesis. In general, H1 receptor antagonists,(doxylamine, diphenhydramine etc.) which are known to be safe in pregnant women, are routinely used for hyperemesis gravidarum. However, there are no adequate studies reporting hydroxyzine exposure in pregnant women. Hydroxyzine is contraindicated in the first trimester, it seemed to be teratogenic in mice and rats. Studies cited in teratology databases, Reprotox and TERIS, reported 5 congenital anomalies without any specific defect pattern in 50 pregnancy exposures. A study from Israeli Teratogen Information Service (TIS), involving a follow-up of 20 pregnancies with hydroxyzine exposure in the first trimester reported a case with renal aplasia, shortened femur and tibia in a stillborn fetus(1).

Methods: Thirty-nine pregnant women, with age range 23-48, applied to Karadeniz Technical University Teratogen Information Service between 1999-2017, were included in the study. Obstetric history and the demographic information of patients were recorded. Birth results were recorded and physical and mental developments of babies were followed up for a year.

Results: Eleven of 39 women lost to follow-up were excluded. 22 had healthy babies, 3 had spontaneous abortions and 1 had elective termination. An infant with left kidney agenesis was born after the concomitant drug exposure. One baby whose mother concomitantly used infliximab and betamethasone had hydrocephaly. A woman with panic attack taking paroxetine additional to hydroxyzine underwent elective termination. The drug exposure was in the first trimester in all pregnant women except two cases.

Conclusions: Although hydroxyzine is a drug labelled as X in the first trimester, in our study 22 of 28 women delivered healthy babies. The left kidney agenesis and hydrocephaly are major malformations observed in our series and the first one is similar to the defect previously reported by Israeli-TIS. The “unsafety” of hydroxyzine use in the first trimester should be checked once again with further investigations and meanwhile its possible relationship with unilateral renal agenesis should be kept in mind.

P-08 BETAHISTINE EXPOSURE IN PREGNANT WOMEN

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Introduction: Vertigo is a very disturbing symptom of vestibular system dysfunction. It is experienced as a spinning sensation illusion, patients experience it either as self-motion, or motion of the environment. Betahistine (Betaserc®, Vasoserc®), a histamine analogue, is used especially for the control of vertigo symptoms of Meniere disease. There is no available data in Reprotox teratology database about betahistine use in pregnancy. So we aimed to review the results of our pregnant women exposed to betahistine.

Methods: 29 pregnant women age range 21-42, who applied between years 1999-2017, were included in the study. Their common indication of drug use was vertigo. They all used the drug in the first trimester. Obstetric history and the demographic information of patients were recorded. Birth results were recorded and physical and mental developments of babies were followed up for a year.

Results: 2 cases lost to follow-up were excluded. 20 of 27 women with betahistine exposure delivered healthy babies. Two women had spontaneous abortions. One of them concomitantly used ramipril, duloxetine, trimetazidine and spiramycin, and the other used sertraline, trazodone and trinetazidine in addition to betahistine. One baby had gastroesophageal reflux. One woman who underwent elective abortion was concomitantly exposed to paroxetine. Moreover, there was a woman who was concomitantly exposed isotretinoin underwent elective termination at 6th week of gestation.

Conclusions: No congenital malformation was observed in 20 infants exposed to betahistine in the first trimester. These findings, however, do not exclude possible teratogenic risks of betahistine. Additional studies are needed to confirm the safety of betahistine use in pregnancy.

P-10 EFFECTS ON DRIVING SAFETY OF DRUGS USED FOR PSYCHIATRIC TREATMENT; CASE PRESENTATION

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Introduction: Drugs that affect brain function may affect driving performance negatively. Drugs such as benzodiazepines, opioid analgesics, barbiturates, antipsychotics, hypnotics, antidepressants may cause much more serious side effects, especially when used with alcohol or in combination. In this case; it is aimed to discuss the person's driving safety and driving skills that used different benzodiazepines, various antidepressants, antipsychotic drugs and Methyl Fenidate HCl

Case: Male, 35 years old, driver in a traffic accident. Alcohol or drug/substance analysis was not performed immediately after the accident. Attention was drawn to the statements made by the health officials in the crime scene that they had smelled alcohol. Days later in the analysis of samples taken with the purpose of searching for hypnotic, narcotic and stimulant substances; 16 ng/ml diazepam, 80 ng/ml nordiazem, 20 ng/ml oxazepam, 2 ng/ml temesepam and 27 ng/ml paracetamol in blood; 7 aminoclonazepam, diazepam, nordiazem and paracetamol in urine; venlafaxine and quetiapine in the hair were detected. When the medical records of the case are examined; alcohol abuse was diagnosed in the hospital, and it was understood that treatment were continued under the outpatient conditions.

Conclusion: Both diazepam and clonazepam have warnings for drivers in terms of driving safety in their prospectus. Some of those; "Like many drugs that affect the central nervous system, diazepam can cause dangerous consequences for vehicle drivers and machine operators, as it can lead to reduced attention and alertness." "Use with alcohol can cause drowsiness." When the characteristics and half-life of the drugs determined by the performed toxicological analysis and the prescription dates of these drugs are compared, it is determined that the person is under the influence of the clonazepam during the traffic accident and may also be under the influence of the drug named diazepam. Regardless of the traffic accident, despite the fact that the person is under the influence of clonazepam; tending to drink alcohol and drive this way. It was concluded that it would be appropriate to assume that the person driving the vehicle under the influence of the drug, which negatively affects his driving ability, constitutes a conscious negligence in the act.

P-12 DEVELOPMENT AND VALIDATION OF AN LC/MS/MS METHOD FOR DETERMINATION OF NEW PSYCHOACTIVE DRUGS IN HAIR

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Introduction: Development and validation analytical methods for the identification and quantification of new psychoactive substances in variable biological matrices is vital significance to study toxicological investigations, drug metabolism, link clinical results and concluding poisoning symptoms, interpret or update existing laws and enact new regulations. Among different biological matrices, hair allows a border time diagnostic window to investigate drug-related history and demonstrate past intake compared to that of body fluids such as blood and urine.

Method: An analytical method for the analysis of 61 analytes that include their metabolites including tryptamine, synthetic cathinones and synthetic cannabinoids in hair samples using liquid chromatography coupled with tandem mass spectrometry by comparison different extraction methods is described.

Results: LLOQ (the lowest limit of quantitation) varied from 0.02 to 19.6 pg/mg concentrations among different analytes. The validation parameters were investigated according to our standard procedure: selectivity, specificity, linearity range, detection and quantification limits (LODs and LOQs), and intra-assay and inter-assay precision and accuracy. Carryover effect, recovery, and matrix effects were also investigated.

Conclusion: Two extraction methods were preformed and it was selected second extraction method after resulting validation parameters due to the better results. This analytical method can be approved to be effective for detection in hair of various classes of new synthetic drugs in forensic toxicological applications.

Keywords: New Psychoactive Drugs, Hair Analysis, LC-MS/MS

P-13 AN OVERALL VIEW ON THE IMPACT OF DRIVING UNDER THE INFLUENCE OF ALCOHOL, ILLICIT SUBSTANCES, AND MEDICINES ON ROAD SAFETY

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All over the world, injuries and deaths due to traffic accidents related with alcohol, illicit substances, and prescription or non-prescription medicines have been a major concern. "Road safety" encompasses safe roads, vehicles, and proficiency in driving performances. In this regard, several projects (e.g., DRUID and ROSITA), and a great number of studies have been conducted in various countries. As expected, most of the reports highlight the major impact of alcohol in Driving-Under the Influence (DUI); therefore blood-alcohol concentration (BAC) limits are already strictly under control in various countries. On the other hand, tremendous increase in drug/substance abuse has raised an equivocal problem- driving under the influence of drugs (DUID). The major threats appear as amphetamine and THC (delta-9-tetrahydrocannabinol)- the active ingredient in marijuana; however more potent and uncontrollable synthetic substances are also in focus. Another less recognized issue of concern in this regard is the safe use of prescription/non-prescription medicines, and their combination with the above-mentioned factors. In this study, we sought to review various reports on the relationship between road safety and alcohol, illicit substances and medicines. Analytical studies conducted on biological samples of impaired drivers in various countries either obtained in road-site testing or as post-mortem examinations were evaluated. Data in our country appears mostly limited to BAC determinations, however illicit substances pose an extremely high risk in our region. Moreover, vigilance on prescription or non-prescription medicines requires more attention. As a result, we gathered the reviewed data and pharmacological info together in order to provide a viable strategy in safe medication use and road safety. In this vein, some complementary methods during patient counselling such as efficient use of auxiliary labels related with safe use of medicines, and follow-up in scheduled timeframes to provide an efficient solution have been sampled. Since pharmacies act as one of the first port of call and play a key role in the healthcare system, pharmacists are expected to inform patients about not only safe use of prescription medicines or OTC but also drug and substance use disorders along with other issues.

P-14 INVESTIGATION OF COMPOSITION OF OGSR FROM DIFFERENT AMMUNITION

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Objective: Chemical analysis of gunshot residues (GSR) can provide useful information about the resolving of events involving the use of firearms. GSR consists of a complex mixture of organic and inorganic material originating from the firearm, the ammunition and the combustion products formed during the discharge. Traditionally, the analysis of GSR is based on the presence of lead, barium and antimony. Environmental pollution has become a big problem nowadays due to the heavy metals formed after the shooting. For this purpose, heavy metal free and lead free primers (HMF and LF) were produced. Analysis of inorganic GSR from LF and HMF ammunition could possibly lead to false-negative results. As no characteristic inorganic GSR particles are produced by these ammunitions We aimed to analyze organic GSR in capsule and gunpowder in our study.

Materials-Methods: A limited number of studies have been published for the analysis and there is no internationally accepted standard analysis method for OGSR. The advantage of the technique developed for the analysis of OGSR is that it can be used in both GSR analysis for heavy metal free ammunition and standard ammunition. In our study, LC-APCI/MS/MS instrument was used for the analysis of OGSR. In order to study the influence of the chemical composition of gunpowder on detected OGSR, six different ammunition were used in shooting sessions. Spent Cartridge, Unburned powder and Swab was analyzed.

Results: OGSR is originating from gunpowder and primer. Propellant formulations are complex composite materials that consist of a number of additives, stabilizers, burning rate modifiers, and plasticizers. We analyzed 7 OGSR (Table 1) which contained in capsule and primer.

Conclusion: The forensic evidence values are reduced when HMF primers are used. Because IGSR have high contamination risk, high secondary transfer rate and absence of characteristic products. Therefore, the analysis of OGSR is of great importance to solve forensic cases. As a new approach in the resolution of the forensic cases committed with firearms, it is aimed to solve forensic cases by means of OGSR detection.

P-15 PREGABALIN INTOXICATION WITH MULTIPLE DRUG ABUSE

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Introduction: Pregabalin-which is a substance that used to treat nerve pain, epilepsy and anxiety- is increasingly being handed out too readily and being used recreationally, according to doctors and pharmacists when it is mixed with other substances it can lead to overdose deaths connected to pregabalin. The deaths caused by it is when people take a cocktail of substances that affect the central nervous system eg heroin, pregabalin and benzodiazepines. It eventually depresses respiration- controlled by the brain- and people who take these cocktails die. It makes the pregabalin users feel relaxed and euphoric in a similar way to tranquilisers. It can also enhance the euphoric effects of other drugs such as opiates and is likely to increase the risks when used in this way. "Pregabalin and Gabapentin" active substance drugs should be given with normal prescription same time it is included in the drugs subject to control, according to Turkey Pharmaceutical and Medical Devices Agency Ministry of Health Circular No. 2013/5.

Case: A 27-year- old male was found dead in his living quarters. Investigators discovered the victim and a drug drinking facility which is called as "bong". The victim was taken to the Forensic Council of Izmir Morgue Department for further examination. The routine toxicological analysis were completed in the Forensic Council of Izmir Chemistry Department. Paracetamol, morphine, hydromorphone, codeine, meconin and pregabalin detected in the victim's blood. Paracetamol, morphine, hydromorphone, codeine, meconin , 6-acetylmorphine, pregabalin and cannabis metabolite THC-COOH detected in the victim's urine. Paracetamol, morphine, hydromorphone, codeine and pregabalin detected in the victim's nasal swab. Paracetamol, morphine, codeine, meconin and pregabalin detected in the victim's bile fluid. The analytes were first screened with cloned enzyme donor immunoassay method and confirmed by gas chromatography-mass spectrometry(GC-MS) and Liquid chromatography-tandem mass spectrometry (LC-MS/MS) Conclusion: In our case, it was concluded that the death was occured by the result of multiple drug intoxication.

P-16 DRUG RELATED DEATHS AMONG FORENSIC AUTOPSIES IN IZMIR BETWEEN 2016-2017

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Introduction: Drug abuse is a worldwide increasing threat. Drug-induced death can be a consequence of direct, indirect or even long-term effects of exposuring to a particular drug or group of drugs. In this study; it is aimed to have information about the narcotic-drugs and stimulant profiles, prevelans and autopsy findings in the forensic autopsies that are narcotic drugs and stimulants related deaths at Izmir Group Chairman Morgue Department.

Method: In our study, autopsies that performed in Izmir Branch of the Council of Forensic Medicine between 2016-2017 were retrospectively examined and 53 patients who were connected to the drug abuse were evaluated. Examination of the autopsy reports revealed the sociodemographic characteristics of the cases, autopsy findings, drug profiles which directly have impact on death. The data were statistically evaluated by processing in the SPSS 22.0 program.

Results: 2 of the evaluated cases were female and 50 were male. It is founded that the mean age was 28.2. It is recorded that 45% (n:24) of the subjects were founded dead at home and 17% (n:9) were died at a medical center. With toxicological examination, amphetamine and amphetamine related substances were founded in 58% (n:17) of the subjects. In 20% of all the subjects alcohol was positive. 11% of the cases were reported to have been treated in a health facility with the diagnosis of drug abuse earlier.

Conclusion: As in the whole world, drug abuse in our country is a serious public health problem. In order to determine the type of abused substances, large-scale mortality studies will be helpful in this area. We believe constructing these studies would be a useful way of fight with the use of narcotic drugs, sedatives and stimulants.

(*This paper was presented as a poster in 15th Forensic Sciences Congress.)

P-19 EVOLUTION OF DISPERSIVE LIQUID–LIQUID MICRO-EXTRACTION IN FORENSIC TOXICOLOGY

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Accurate, rapid and economic qualitative and quantitative analysis of trace amount substances in biological, environmental and food products is an important issue. Mostly, such substances must be taken from the matrix (separation) and concentrated (enrichment) before determining with analytical equipment. For these processes liquid-liquid, solid-liquid extraction and solid phase extraction are commonly used. However these methods are recently replaced by microexraction methods minimizing organic solvent consumption, simplifying sample preparation steps, providing high enrichment rates and appropriate to automation. Dispersive liquid–liquid micro-extraction (DLLME), a miniaturized LLE technique, attracted the attention of analysts and has been widely used for the extraction of various types of analytes from different matrices, such as water, tissue, biological fluids and food matrices, since its introduction in 2006 by Rezaee et al. DLLME has attracted the interest of forensic toxicologists in recent years. DLLME is a simple, fast, inexpensive and environmentally benign micro-extraction technique with high enrichment factors and extraction efficiencies. Forensic toxicology is the scientific study of poison in relation to the law, and forensic toxicologists detect and quantify toxicant(s) in tissue, organs and body fluids. Because of the highly complex nature of toxicant-specific matrices such as blood, plasma, urine, tissue, saliva, vitreous humour and hair, sample preparation for the analysis of various drugs/poisons still remains a challenge for forensic toxicologists. As, in forensic analysis, every case is unique and the nature of target analytes is unknown, it is difficult to standardize the whole analytical procedure, similar to other branches of analytical chemistry. In such cases, systematic toxicological analysis (STA) is required. Moreover, sample availability is limited in most toxicological cases, and the analysis is usually untargeted. Therefore, a sample preparation methodology, which requires least amount of sample, has to be proposed. On the contrary, analytical approach for targeted analysis of a specific drug/poison is quite easy and different from STA. This study focuses on various applications and operating procedures of DLLME for various classes of drugs and poisons of forensic interest. In addition, viability of future trends for the application of DLLME in forensic toxicology has been addressed.

P-21 EVALUATION OF PREGNANTS WHO ADMITTED TO DOKUZ EYLUL UNIVERSITY TERATOGENITY INFORMATION SERVICE DUE TO MEDICINE USE AFFECTING THE CARDIOVASCULAR SYSTEM

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Introduction: The proportion of babies born with major or minor malformation is reported as 1-3%, 70% of these are unknown causes, and less than 10% are known to be responsible for medicines. It is known that cardiac diseases and also uses of cardiovascular system medicines (CVSMs) are common but the effects of these on the developing fetus are not clear. It is aimed to evaluate the demographic characteristics, maternal and neonatal outcomes of pregnants who used CVSMs during the pregnancy period admitted to the Dokuz Eylul University Terotogenity Information Service (DEU TIS) between January 2014 and December 2016.

Methods: In this retrospective, descriptive, cross-sectional study, demographic characteristics, types of the CVSMs, concomitant medication/substance use, medical and obstetric histories of cases, maternal and neonatal outcomes were evaluated. The data were obtained from the DEU TIS registration forms and verbal communication with pregnants. The obtained data were recorded and analyzed in "SPSS 22.0" program. The $p<0.05$ values of the obtained data were accepted as significant.

Results: A total of 47 cases were included in the study. The mean age of pregnants was 34.0±5.5 years and mean pregnancy week on presentation to DEU TIS was 9.2±4.7 weeks. It was found that 76.6% (n=36) of the cases used only one group CVSM and 23.4% (n=11) used more. The most commonly used drugs were beta receptor antagonists (n=24), angiotensin converting enzyme inhibitors (n=6), calcium channel blockers (n=5), angiotensin receptor blockers (n=4) , antilipidemics (n=3) and antiarrhythmics (n=3). The mean birth week was 35.9±8.2 and 42 infants (89.4%) were healthy. Five pregnancies (10.6%) were aborted. No malformation was found in healthy borns. There was no statistically significant correlation between pregnancy termination and abortion, which group of CVSM in pregnancy ($p>0.05$).

Conclusions: The use of CVSMs is important during pregnancy, because of the effects on the developing fetus are not fully known. It is difficult to determine safety of CVSMs during pregnancy and establish causal relationship between maternal/neonatal outcomes and CVSMs exposure.

P-24 ASSESSMENT OF THE EFFECT OF DIFFERENT COOKING TECHNIQUES ON ARSENIC AND CADMIUM CONTENT OF RICE MEALS

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Exposure to toxic metals has become an increasingly recognized source of illness worldwide, Both cadmium and arsenic are ubiquitous in the environment, and exposure through food and water as well as occupational sources can contribute to a well-defined spectrum of disease. The symptom picture of arsenic toxicity is characterized by dermal lesions, anemia, and an increased risk for cardiovascular disease, diabetes, and liver damage. Cadmium has a significant effect on renal function, and as a result alters bone metabolism, leading to osteoporosis and osteomalacia. Cadmium-induced genotoxicity also increases risk for several cancers [1]. Rice, is one of the most produced and consumed grains in our country and in the world. It is consumed mostly in Central Asian countries. Contains more starch than other cereal products. It is used in rice, salad and soup. In addition, rice is used for making starch and rice flour. Due to the rapid industrialization in the earth in recent decades, soil contamination in some areas, is raising the concern about food safety. Consumption of rice represents one of major exposure route for the toxic elements cadmium (Cd) and arsenic (As). However, the As and Cd content of the rice derived foods can be differed according to their preparation method. In typical rice cooking two methods are the most used. In one process, rice is roasted with oil and then, water added into the rice and cooked. In another process, rice is wetted with marrow water along with salt and lemon juice. Then after rice is cooked upon the addition of water and oil[2]. Exposure with marrow water in second way can lead the removal of heavy metals from rice. Thus, less amount of heavy metal can be intake by human body. In this study, two cooking method was tested by the analysing the As and Cd content of cooked rice meals with ICP MS technique after microwave digestion. The effected of wetting time, salt and lemon juice addition on the As anc Cd content of cooked meal was also investigated.

P-25 THE EFFICIENCY OF SPE CARTRIDGES FOR ILLEGAL SUBSTANCE ANALYSIS IN SWEAT

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Introduction: Sweat is an alternative biological material for monitoring drug abuse. Illegal substances generally are weak bases with low protein binding facilitating the transfer of lipid-soluble compounds from blood to other fluids and/or tissues. This can lead to an accumulation in biological materials with pH values lower than that of plasma (pH 7.4) or ion trapping of the drugs in the more acidic matrix. Sweat is a slightly acidic matrix, with a pH ranging from 4 to 6.8. The other important factor in the transfer of drug into sweat is the lipophilicity of the compound. In this study, it was aimed to compare the efficacy of different solid phase extraction (SPE) cartridges in the determination of Δ9-Tetrahidrokannabinol (THC), amphetamine and derivatives, morphine, cocaine and benzoylecgonine by Gas Chromatography Mass Spectrometry (GC-MS).

Methods: 500 ng/ml Δ9-THC, amphetamine (AMP), methamphetamine (MET), 3,4-methylenedioxyamphetamine (MDA), 3,4-methylenedioxymethamphetamine (MDMA), morphine, cocaine, benzoylecgonine and internal standards were spiked in to the two different buffer solutions which were pH 4.5 acetate buffer and pH 6 phosphate buffer. Clean Screen THC020, Clean Screen DAU, SampliQ C18 and Bond Elut Plexa SPE cartridges were used for extraction. Condition, wash and elution solvents were selected for each cartridges according to their chemical properties. After elution, samples were dried under nitrogen stream. Dried extracts were reconstituted using appropriate derivatization agents. Then, transferred to vials and 1 µl of aliquot injected to GC-MS.

Results: The best results were obtained with C18 cartridges for Δ9-THC, amphetamine, methamphetamine, MDA, cocaine, benzoylecgonine and morphine standards at different pHs (4,5 and 6) . No analyte was detected in the Clean Screen THC020 and Bond Elut Plexa SPE cartridges. Only Δ9-THC was detected in the Clean Screen DAU SPE cartridge at pH = 4,5 and 6.

Discussion: Sample preparation stage is an important part of the forensic toxicological analyzes performed on biological materials such as sweat. Thus, in this study simultaneous analysis of

acidic and basic analytes was performed, different cartridges were studied for solid phase extraction and the most effective cartridge was selected.

P-27 HERBAL SLIMMING PRODUCT EXPOSURES IN PREGNANCY EVALUATED BY TERATOGENICITY INFORMATION SERVICE: A RETROSPECTIVE STUDY

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Introduction: The use of herbal slimming products (HSP) during pregnancy can lead to serious adverse effects on pregnant and/or fetus. Purpose: To evaluate the demographic characteristics, maternal and neonatal outcomes of HSP exposures evaluated by Dokuz Eylul University Teratogenity Information Service (DEU TIS) between 2007 and 2014.

Methods: In this retrospective, descriptive, cross-sectional study, demographic characteristics, contents of HSP, concomitant medication/substance use, presence of x-ray exposure, medical and obstetric histories of cases were evaluated. Verbal informed consents were obtained and also, maternal and neonatal outcomes were obtained from cases during the telephone call. Chi-square test was performed for statistical analyses.

Results: For a teratogenity risk evaluation, 1,496 pregnants admitted to DEU TIS between 2007 and 2014; 21 (1.40%) of them were due to HSP exposures during pregnancy. Of the nineteen (90.48%) cases that were reached via telephone inquiry, 18 cases gave verbal informed consent. The mean age was 31.44±3.88 and mean pregnancy week on presentation to DEU TIS was 7.48±2.46 weeks. All cases exposed to HSP in the first trimester. In total, cases exposed to 14 types of HSP that consisted of 149 substances (mean 8.28±4.66). The most frequently exposed substances were green tea, ginger and l-carnitine. Active smoking was found in 5 (27.78%) and x-ray exposure was in 1 cases. Hormone preparations (28.57%) were the most frequent agents in all concomitant medications, followed by analgesics (24.49%). Most of the HSP exposed pregnants delivered at term, and had healthy infants (66.67%). There was no statistically significant correlation between pregnancy termination and HSP exposures in pregnancy ($p>0.05$). One woman with a history of type 2 diabetes mellitus and used concomitant medications with HSP during first four weeks of pregnancy, had a newborn with Fallot tetralogy. Another neonate was born with anchiloglossia whose mother exposed to only HSP. There were two cases with voluntary currettage and one woman with preterm delivery.

Conclusions: Because an evidence and/or consensus of their teratogenicity is inadequate, the use of HSP is not recommended during pregnancy. It is difficult to determine safety of HSP

during pregnancy and establish causal relationship between newborn abnormalities and HSP exposure.

P-28 THE EFFECTS OF DIET AND REGULAR MIXERS ON ALCOHOL PHARMACOKINETICS

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Background: Consumption of alcoholic drinks with a 'diet' mixers is increasing. There reports in the literature that, when compared to standard mixers, these alter the pharmacokinetics of alcohol. Possibly by causing more rapid stomach empting. The aim of this study to evaluate breath alcohol concentrations and the rate of gastric emptying using 13C Acetate in healthy volunteers following consumption of either sucrose containing or artificially sweetened alcoholic drinks.

Methods: This was an open labelled two-way crossover study. On two occasions, the participants ingested alcohol, once with diet coke, and once with regular coke. Seven healthy volunteers were studied twice in randomized order. On each session, they drunk a standardised volume of vodka (37.5 % ABV), prepared with either 'regular' coke including sugar, or 'diet' coke with artificial sweetener. Their breath alcohol concentrations were taken every 15 minutes during 3 hours with lion alcolmeter® SD-400 and lion alcolmeter® 500. Simultaneously, their breath samples for gastric emptying measurement were taken in breath bags. These breath samples were analyzed with an IRIS® instrument to get t1/2 and tlag parameters.

Results: Both the peak breath ethanol concentration (440± 72.3vs. 386± 62.9mg/L) and the area under the breath ethanol curve between 0 and 180 minutes (507.4±67.6vs. 448.1± 50.8units) were greater with diet coke. Gastric half-emptying time and lag phase time were calculated from the 13C percent dose recovery values measured by IRIS® instrument with nonlinear regression analysis. Gastric half-emptying time was less for the diet drink than the regular drink (86.3±7.8 vs. 88.4±17.1 min) but tlag was greater for diet drink than the regular drink (48.1±9.6 vs. 46.1±15.7 min).

Conclusions: This study emphasizes that elements other than just the alcohol content of a drink should be taken into consideration in bearing in mind safe quantities of ingestion and the possibility for intoxication. The lack of sucrose in diet mixers might result in quicker gastric emptying of alcohol, causing an increase in its absorption rate into the blood, producing larger peak inebriation and greater exposure to various alcohol related hazards.

P-29 CLINICALLY SIGNIFICANT DRUG-DRUG INTERACTIONS THAT ENHANCE ANTICOAGULANT OR ANTIPLATELET EFFECTS IN THE ELDERLY INPATIENTS

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Introduction: Co-administiration of antithrombotic and anticoagulant drugs may show additive effects and can increase the risk of bleeding. Enoxaparin and heparin are well-known and frequently used drugs for their anticoagulant effects. Addition to widespread antithrombotic drugs, acetylsalicylic acid and clopidogrel, selective serotonin reuptake inhibitors (SSRIs) have also antithrombotic effects. The risk rating category for drug-drug interactions (DDIs) between antithrombotic and anticoagulant drugs according to Lexi-Comp Online Drug Interaction database is 'C' which is defined as ''The benefits of concomitant use of these two medications usually outweigh the risks. An appropriate monitoring plan should be implemented to identify potential negative effects''.

Purpose: The aim of this study was to evaluate DDIs between antithrombotic and anticoagulants in the elderly patients of intensive care unit (ICU) at Marmara University Education and Research Hospital.

Methods: Database of Medical Pharmacology Department was retrospectively analyzed for consultations of surgical ICU between 03.01.2018-28.06.2018. Medication charts of the patients were checked for concominant use of antithrombotic and anticoagulant drugs. Lexi-Comp Online Drug Interaction database was used for evaluation of DDIs.

Results: There were 163 consultation reports for surgical ICU. Of the 163 reports, 21 (13 %) had DDIs between antithrombotic and anticoagulants. Combination of enoxaparin and acetylsalicylic acid was the most frequent DDI (43 %, n=9) among these patients. Six patients (28 %) were found to be treated with enoxaparin, acetylsalicylic acid and clopidogrel. Two patients (9 %) had potential DDIs between enoxaparin and escitalopram. Concominant use of 4 interacting drugs, enoxaparin, acetylsalicylic acid, clopidogrel and escitalopram was detected in 1 patient. Rest of the 3 patients were found to use combination of 3 interacting drugs, including enoxaparin, heparin, acetylsalicylic acid or ticagrelor.

Conclusions: DDIs between antithrombotic and anticoagulant drugs may lead to clinically important and life threatening bleeding effects. Therefore elderly inpatients who are at higher risk for DDIs with altered pharmacokinetics, polypharmacy and co-morbidities, should be

monitorized closely for bleeding symptoms related with potential DDIs not only with well-known antithrombotic and anticoagulants but also with SSRIs.

P-30 EVALUATION OF MEDICATION ORDERS OF INTENSIVE CARE UNIT PATIENTS FOR THE CO-ADMINISTRATION OF CNS DEPRESSING DRUGS

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Introduction: Drug-drug interactions (DDIs) can lead to life-threatening adverse/toxic effects or therapeutic failure. Co-administiration of central nervous system depressing drugs (CNS-Ds) may cause respiratory depression or excessive sedation as a result of suppression of the CNS. We aimed to determine the multiple use of CNS-Ds in the intensive care unit (ICU) patients.

Methods: Surgical ICU patients (n=58) who were consulted to Medical Pharmacology Outpatient Clinics at Marmara University Hospital between 03.01.2018 and 25.07.2018 were included in the study. DDIs of CNS-Ds were detected by using the risk rating categories of the Lexi-Comp Online Drug Interaction database.

Results: Of the 58 ICU patients, 31 % were found to have multiple use of CNS-Ds. Co-administiration of 2 drugs (21 %), 3 drugs (8 %) and 5 drugs (1 %) were detected among the medication charts of the patients. The most frequent CNS-D drugs were levetiracetam (n=33) and tramadol (n=33). Remifentanil (n= 28), propofol (n= 13), fentanyl (n= 6), quetiapine (n= 5), morphine (n= 4), pregabalin (n= 3), clonazepam (n= 2) and midazolam (n= 1) were the other CNS-Ds contributing to potential DDIs. The most frequent potential DDI was between levetiracetam and tramadol (29 %, n= 17). This combination was a D risk rating category DDI which should be avoided. Levetiracetam and remifentanil (n= 16), tramadol and remifentanil (n= 11), remifentanil and propofol (n= 7) and levetiracetam and propofol (n= 6) were the other combinations for potential DDIs that can lead to clinically important CNS effects.

Conclusions: DDIs between CNS-Ds may be more vital for ICU patients who usually need more than one CNS drugs. Particularly co-administiration of levetiracetam, an antiepileptic drug, and tramadol, an opioid, should be carefully monitorized in the ICU patients if modification of the therapy is not possible.

P-31 ANALYSIS OF POTENTIAL DRUG-DRUG INTERACTIONS LEADING TO QT INTERVAL PROLONGATION IN THE INTENSIVE CARE UNIT PATIENTS OF A UNIVERSITY HOSPITAL

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Introduction: Many medications may adversely cause QT-interval prolongation. Co-administration of those medicines in intensive care unit (ICU) for different purposes may additively interact and lead to life-threatening tachyarrhythmias in critically ill patients. **Purpose:** This study aimed to analyze the potential drug-drug interactions (DDIs) leading to QT-interval prolongation in ICU patients of Marmara University Hospital.

Methods: Regular DDI consultation reports for ICU patients by medical pharmacology department in our hospital were retrospectively analyzed for 6 months (01 January - 30 June 2018). The study is focused on clinically important DDIs, interactions in the C, D, or X risk rating categories of the Lexi-Comp Online Drug Interaction database were analyzed (1).

Findings: Of 163 cases (155 ICU patients), 18 (11 %) were found to have potential drug-drug interaction which may have a risk of QT prolongation and 4 of these patients had more than one potential interaction for QT prolongation (2.4%). We detected 29 clinically important DDIs among the patients' orders. Of the interactions 13 (45%) were in "X category" that the combination should be avoided because of concomitant use significantly increases the risk of adverse effect. Nine (31%) of them are in "D category" to consider therapy modification that include aggressive monitoring, empiric dosage change or switching to alternative agents and 7 (24%).of them are in "C category" that needs the monitoring of therapies against unwanted (QT prolongation) effects. The most common interacting medicines in this sense were domperidone (n=9), amiodarone (n=8), quetiapine (n=7) and escitalopram (n=6).

Conclusions: DDIs may be a significant cause of QT prolongation in ICU patients (2). Prediction of undesired complications of pharmacotherapy has a crucial role especially in critically ill patients such as ICU patients. Some of the commonly used medications in ICU from different therapeutic groups such as domperidone, amiodarone, escitalopram and quetiapine may increase the cardiac arrhythmia risk significantly.

P-32 A 1-YEAR EVALUATION OF ANALYSIS RESULTS OF ABUSED SUBSTANCES IN A UNIVERSITY HOSPITAL

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Introduction: Substance abuse refers to the harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs**.** The aim of this study was to evaluate retrospectively our 1 year experience of analysis of abused substances in our Drug Analysis Laboratuary.

Method: This retrospective study was carried out between September 2017 and August 2018 at the Eskisehir Osmangazi University Hospital, Eskisehir, Turkey. Samples was examined, focusing on 3 age groups (aged 12-17, 18-24 and >25 years) and several commonly abused substances (alcohol, ecstasy, cocaine, amphetamine, bonsai, marijuana, and opiate). Our hospital database was used to document the total number of urine and blood samples. Annual data were used to assess gender, age and positive consequences.

Results: The number of samples was a total of 7838 analyses were evaluated. We have classified all samples as 2 groups for comparison of gender and age (*Group 1*: 1767 analyses for ecstasy, amphetamine, bonsai, marijuana, cocaine,opiate and *Group 2*: 6071 analyses for alcohol) Overall rates of people suspected of using abused substances were significantly higher for males (*Group 1*: 89.9%, *Group 2*: 82.6%) than for females (*Group 1*: 10.1%, *Group 2*: 17.4%). Most of the people suspected of using abused substances were more than 25-year-old (*Group 1*: 72%, *Group 2*: 72.6%). Positive result rates were determined as 21.1% for amphetamine, 16.7% for marijuana, 8.1% for alcohol, 1.5% for ecstasy, 1.3% for cocaine, 1.0% for opiate and 0.7% for bonsai).

Conclusion: Treatment planning and prevention of serious medical consequences often rest on the accuracy of the admission drug testing. Additionally, understanding the reasons for gender and age differences may help in the development of targeted and more effective prevention and treatment interventions.

Keywords: abused substances, gender, age, positive consequences

P-33 A 1-YEAR EXPERIENCE OF THERAPEUTIC DRUG MONITORING (TDM) IN A UNIVERSITY HOSPITAL

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Introduction: Therapeutic drug monitoring (TDM) reveals pharmacokinetic variability in different patient population in clinical practice, regarding possible gender variation and age-related changes. The purpose of this study was to assesss retrospectively our 1 year experience of TDM in our TDM Laboratuary.

Method: This retrospective study was carried out between September 2017 and August 2018 at the Eskisehir Osmangazi University Hospital, Eskisehir, Turkey. Patients included in this study were those admitted to our hospital. Our hospital database was used to document the total number of patients. All patients were anonymised, and data regarding gender, age, range of serum concentrations and admitted department were collected.

Results: The number of patients admitted to our hospital was a total of 11367 TDM analyses were performed. Of the patients, 53.4% were male and 46.6 % female. Of all TDM analyses were studied in 34.3% children, aged 0-18 years and 65.7% adults, aged > 18 years. We have listed the analysis results as: Drug name, percentage (%) of patients within sub- therapeutic, therapeutic and above-therapeutic ranges, respectively. Valproic acid, 24.0%, 65.1% and 10.9%. Tacrolimus, 19.3%, 77.4% and 3.4%. Levetiracetam, 22.1%, 71.9% and 5.9%. Lithium, 83.2%, 15.3% and 1.5%. Carbamazepin, 19.7%, 69.2%, and 11.1%. All Cyclosporin A analyses were therapeutic ranges. Digoxin, 32.1% , 54.1% and 13.8%. Phenobarbital, 45.7%, 54.1% and 13.8%. Phenitoin, 57.8%, 34.3% and 7.9%. Methotrexat, 4.4%, 95.6% and 0.0%. Everolimus, 24.3%, 67.6% and 8.1% . Lamotrigine. 52.7%, 47.3% and 0.0%. Topiramate, 46.7%, 53.3%and 0.0%. Micofenolic acid, 10.3%, 51.7% and 37.9%. Theophylline, 45.8, 54.2% and 0.0%.

Conclusion: Our results show that most of the TDM analyses were within therapeutic ranges. TDM could show an opportunity to optimize drug therapy in patients, particularly when dealing with long-term treatment.

Keywords: Therapeutic Drug Monitoring (TDM), serum drug level, gender, age

P-34 ANALYSIS OF ILLICIT DRUGS IN DRIED BLOOD SPOTS USING LC-MS/MS METHOD

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The blood that obtained by opening a vascular access is considered as golden standard for analysis of illicit drugs. However, this practice brings restrictions and/or difficulties in its wake such as high storage and transport costs, being invasive, need for health professional to obtain sample, and risk of transmission of blood borned infections. At this point, in order to overcome the difficulties that are brought by conventional blood sampling methods, Dried Blood Spot (DBS) is appeared as a good alternative. With this study, ability of dried blood spots, which were derived from venous blood, to represent the whole blood has been being researched in terms of detection of illicit drugs. Due to obtained data, it is aimed to determine how useful DBS is and what advantages/disadvantages DBS brings on in forensic practices. At the beginning, four different solvents, which were 0.01M NaOH:Ethyl Acetate:MeOH (1:1:1, v:v:v), MeOH:ACN (3:1, v:v), 80% ACN, and MeOH itself, were compared by applying the same extraction steps and 80% ACN was chosen in terms of recovery performances. These extraction steps were shaking, ultrasonic bath, and centrifuge, removal of DBS cards, acidification, vortexing, drying, and reconstitution, respectively. Then, established method was validated according to the parameters of bias, calibration model, carryover, interference, ionization suppression/enhancement (matrix effect), limit of detection, limit of quantitation, precision (within-run and between-run) and stability. Validation results are all within acceptable limits. Our Study is not completed yet. We are at the stage of evaluation of stability samples and real cases. We chose stability points as 10, 35 and 90 days. According to our plan, in order to evaluate usefulness on real cases, venous blood obtained from at least 24 volunteers who would have applied to Forensic Toxicology Laboratory of Çukurova University Department of Forensic Medicine will be used. We believe that, the data that obtained from this study and further works that will be carried over on this topic will ensure practical, rapid and reliable sampling on crime scenes and fields out of laboratory.

P-37 WARFARİN OVERDOSE İN AN ADULT: ATTEMPTED SUİCİDE OR MURDER?

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Introduction: Warfarin that is the vitamin K antagonist (VKA) is extensively used to prevent the prophylaxis and for the treatment of thromboembolic disease as new oral anticoagulation agents. Warfarin requires common monitoring with International Normalized Ratio (INR) and follow-up of patient when it takes therapeutically due to its narrow therapeutic range.

Case: A 39-yr-old woman who consulted in the emergency unit alone due to bleeding from her mouth at March. The patient who underwent a mitral valve replacement 12 years ago regularly has ingested warfarin and has had never an event related-INR for 12 years. As she consulted in emergency unit, the first INR value monitoring was 12 and the Hb (hemoglobin) value was 9 g/dl. There were extensive rhonchi and radiological lesions of the patient with alveolar hemorrhage. The hemorrhage associated the patient's high INR value. The serum level of IgE was high. The INR value returned normal level after the fresh-freeze plasma (FFP) and low dose steroid were given to the patient so the patient was discharged. She consulted to the emergency unit due to hemoptysis again after 1.5 months and the INR value was 17. She said that she has not ingested warfarin or any other drug and any herb for ten days. The FFP were given to the patient again and the INR decreased 2 after two days. But hemoptysis increased after 3 days and INR increased 4. Then the patient developed severe hypoxia and the INR increased 9. After the patient entered dialysis for 3 days and isolated from patient's relatives, the INR and the other values was normal level and discharged. Conclusion: Meanwhile warfarin concentration in patient's blood was determined 2155 ng/ml that is in toxic range with reference to literature by LC/MS/MS in Forensic Toxicology Laboratory. After healing so isolated and entering the dialysis patient, brought to mind the events of attempted suicide or murder may have. The patient was taking warfarin herself or was being given from the outside. We communicated this case to the judicial authorities in order to investigate the case.

P-38 POISONS AND POISONINGS IN CINEMA

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In more than 1200 films casted from year 1900 to 2010, poisons appear either as a "leading role" or as an "auxiliary/supporting element", and number of films thematizing "poison" is highest in period of 2000-2010. The principal motive appears as revenge, and most of the poisoned victims inhabit poisoner's surroundings, some psychopathic serial killer poisoners also take part. While evildoer-characters like "Fu Manchu" cause mass-poisonings, "Poison Ivy" or "Scarecrow" in "Batman" employ poison besides other weapons. Examples include films by Alfred Hitchcock as well as others like "Hamlet", "Contergan-Just One Tablet", "Arsenic and Old Lace", and "Poisoned by Polonium". Apparently, impressive images of poisoning played a central part in novels by (and in adaptations of) Agatha Christie, "Queen of Crime" who illustrated extensive skills on chemicals. Guidance of knowledge mostly gained during her duty in a pharmacy during World Wars I&II appears as the main motive, and choice of deadly substances was extremely careful:Characteristics of toxicant and pathophysiological consequence were matched professionally and provide typical clues to discovery of murderer, e.g. poisoned glass of champagne in "Sparkling Cyanide", arsenic in "Murder, She Said", and thallium in "The Pale Horse". Toxic plants nearby such as hemlock, yellow jasmine, and foxgloves were also of note. A similar example is "Mississippi Mermaid" by François Truffaut, in which it turns out that the wife, played by Catherine Deneuve had been adding a rodenticide into her husband(Jean-Paul Belmondo)'s coffee. Some policy-shaping examples also exist as "Erin Brockovich", based on a true story, which narrates a struggle to prove the relationship between high incidence of adverse health effects and contamination of water supply with hexavalent chromium from an industrial source. Use of mushrooms in "The Beguiled" and "Phantom Thread" are recent examples. Therefore, motif of "poison" can be found throughout the history of cinematography, and among causes of death, poisoning comprises a unique part.
Key words: Toxicity, poison, poisoning, cinema

P-39 EFFECT OF NARCOTIC AGENTS ON FRACTURE HEALING IN RATS

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The basic structures which are necessary to move are skeletal and muscular systems. The continuity of the bone and anatomical integrity of the deterioration is defined as fractures. Bone is broken if the mechanical strength which applied the bone structure is more than the carrying capacity of the bone. Treatment begins as soon as the fracture occurs. Being the absence, in correct or delayed of fracture healing is one of the major problems of the orthopedics and traumatology clinicians. Many factors have been shown to have an effect on the fracture healing. In this study, we aimed to investigate the effect of narcotic agents on fracture healing in rats in the point of biomechanic, histopathological and radiological effects. Male Wistar Albino rats (n=64) weighing 250-300 mg were used in this experimental study. 4 groups (1 control and 3 experiments) constituted and each group had 16 rats. Also the groups were divided to two groups for histopathologic and biomechanic research. First and second groups were respectively intraperitoneally (i.p) administered morphine (3mg/kg) and cannabis (1 mg/kg). Cocaine hydrochloride (2 mg/kg) which was dissolved in normal saline was administered (i.p) to last group. These doses of morphine, cocaine and cannabis were administered to each group every day to addict the drug of abuse for two weeks. Transverse fracture was created from the mid-diaphysis region using bone shearing the right femur bone by osteto method after sedoanalgesia was made all groups, including control group at the end of the first week. Femoral fractures were detected as retrograde with Kirschner Wire (K-Wire) which had equal thickness and size (2mm). Morphine, cocaine and cannabis were given to all groups throughout 6 weeks. They were sacrificed by cardiac blood collection method at the end of sixth week after high-dose anesthesia was administered all rats. The effect of narcotics agent on fracture healing in rats in the point of biomechanic, histopathological and radiological effects were researched and evaluated

P-40 A SPORTIVE PERFORMANCE AND NANO-DOPING

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Introduction and purpose: It is called Nano-Doping that the applications to increase the performance in cells or tissues with the help of nanomolecules. The fact that these nanomolecules can enter the desired tissues quickly and without any immunity is another way of worrying about gene doping. For this purpose, gene constructs may be used by themselves or RNA and small RNA molecules may be used. The purpose of this study is to provide information on gene doping and nano-doping methodology, risks, and methods of detection.

Method: With genetic studies on sportive performance, legal arrangements should be made to prevent people from being intervened except where they are likely to be susceptible to which types of sport in childhood. In this context, the literature was searched and the subject was evaluated and interpreted.

Results: Genetic research, analysis and testing are the most healthy to be confined to those who engage in sports and do it with pleasure, it is the healthiest to be limited by the influence on the factors such as the training program and ability. Athletes, coaches and health professionals should be informed about gene doping and damages, so more effective studies on this issue should be done.

Conclusions: Doping at sports, which started with plants and drugs, has passed to a new stage with genes. Although the traces of gene doping can be observed nowadays, it is due that Nano Doping methods (nanonode materials very fast tissue repair and healing) which do not leave any trace in the near future will come out. In place of this practice which disregards the competition right on equal terms and athletes' health and provides an unfair advantage the choice of appropriate sportive activities for the genetic structure and the use of natural means to improve performance, and the general attitude to achieve more realistic and continuous successes.

P-41 AUTOPSY SAFETY IN THE CONTEXT OF TERRORISM BIOLOGICAL AND CHEMICAL WARFARE AGENTS USE

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Introduction and purpose: Terrorist activities may carry out in various dimensions such as national, ethnic, political, religious, economic, ecologic, ideologic, or electronic. However, chemical and biological terrorism is especially much more dangerous as it can also cause mass destructions. In this study, our aim is to review the rules that must be obeyed in order to minimize potential risks in autopsies of chemical agent related death bodies.

Method: The problem of transmission of infections and chemical agents at autopsy was discussed in the light of literature and possible precautions against infection and chemical agent during autopsy were stressed. Also in our study we discuss feasibility in the necropsy procedures of the bio-safety levels used for the microbiological and bio-medical laboratories.

Results: Autopsy is a good method that is used in order to learn reason of death. If autopsy is not done in suitable conditions, it could be a health problem for autopsy performers and environment. Especially agents in gas form could cause intoxications and death. Differences in types and characteristics of infective agents make it mandatory for the physician performing the necropsy procedure to follow certain standards in order to protect the environment. Preventive measure to be taken in necropsy room should cover the process ranging from planning the necropsy room, individual protective measures and disposing the biological wastes to laboratory investigations. **Conclusions:** We aimed to observe the rules that should be followed to minimize the risks of the autopsy, in this study. For this reason physicians who perform autopsies must know characteristics of chemical warfare agents, pre-autopsy decontamination procedures and protective safety precautions.

P-42 STUDY DRUG–RITALIN

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Introduction and purpose: Ritalin is a drug of methylphenidate which is used to treat the attention deficit disorder. It is also used as a cognitive enhancer and a drug. The purpose of this study is to give information about the methodology of ritalin, risks, and side effects.

Method: The usage of Ritalin shows that the boundary between medicines and harmful agents, such as drugs, is really thin. And we must determine this boundary, medicines should be used for health, not social needs.In the context of this information, the literature was searched and the subject was evaluated and interpreted.

Results: Ritalin is defined as a drug that decreases hyperactivity and distractibility and improves concentration. When it's taken, methylphenidate inhibits the norepinephrine and dopamine transporters which mean an increase in the concentration of both norepinephrine and dopamine levels in brain. By keeping these levels high for long enough ritalin users don't lose interest and get distracted easily. When its used for a long time, side effects occur and addiction starts. These side effects could be like fast heartbeat, high blood pressure nervousness, anxiety, insomnia, stomach pain, loss of appetite, weight loss, nausea, vomiting, dizziness, palpitations, headache, vision problems, skin rash, psychosis, and numbness etc. People who use this drug widely used in many parts of the world, from the United Kingdom to the Iran, ignore side effects. They see it as a motivation to start work, to work more quickly when there is not enough time. Some of them see it like coffee and most time the students use when their exam period started and the most their reason was that it helps them to more concentrate.

Conclusions: In this article we searched about Ritalin because it is more common now, but ritalin is not the only drug used for such purposes, Aderall and Concerta are drugs that cause similar effects. They are also spreading rapidly among students and employees. Detailed information about the medicines should be given in order to prevent this misuse.

P-43 ROADSIDE AND WORKPLACE DRUG TESTING

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Introduction and purpose: With the developing technology in the 90s, hair, saliva sweat was started to be used in the detection of drugs. This technology has enabled the production of commercial kits that detect drug in saliva in 2000's to become a solution under the influence of drugs in traffic. At the same time, some states have begun to do drug tests at workplace. The purpose of this study is to give information about the roadside and workplace drug testing in urine, oral fluid and hair.

Method: In the context of this information, the literature was searched and the subject was evaluated and interpreted.

Results: However, in ROSITA 1 it was understood that the tests used were not suitable for use in road tests when the sensitivities, threshold values and false positive / negative controls were checked .New tests developed after the publication of these results were researched with the ROSITA-2 project. The result of that research also showed that the use of the tests was not sufficient. Under the project called DRUID, the use of oral liquid was accepted with the developing technology. Many roadside test companies continue to improve their tests, but usage discussions are ongoing in terms of threshold values and false positive value. By the way the topics discussed in the drug and alcohol tests in the workplace are ethical elements .Because it is easier to do these tests in the workplace. Samples are taken and sent to the necessary laboratories and examined in detail with devices such as GC-MS, LC-MS. Also an independent forum for all issues related to workplace drug testing "European Workplace Drug Testing Society" have explained and published guidelines. This guideline explains how to take and how much samples should be taken for drug testing on the road for urine, hair and oral fluid.

Conclusions: The first study conducted on this subject was published in Turkey in 2011. By the circular issued by the Prime Ministry in 2012, it is deemed appropriate to make legal arrangements for the detection of drugs in drivers by taking the necessary training of the necessary devices and personnel until 2015, and to perform these tests in.

P-44 CAN WE OPTIMIZE BIOMONITORING?

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Introduction: After extensive use as a means of assessing environ- mental safety, biomonitoring is becoming a primary tool in assessing environmental condition and verifying compliance with effluent limitations. Biomonitoring is an element of environmental management that must become more sophisticated to meet the demands of legislation and public concern for environmental safety. The advantages of biological monitoring of the environment have been long recognized. Direct measurements on biota of importance rather than the use of chemical surrogates, integration over time and the ability to measure the perhaps subtle changes brought about by minor or intermittent pollution have all been propounded as advantages. There appear to be a variety of barriers to the wider adoption of biomonitoring approaches. The perception that biomonitoring takes longer and is more expensive than chemical monitoring. The idea that chemical measurements are an adequate surrogate for direct measurements of biological change. The belief that interpretation of biological data is complex and uncertain in comparison with chemical data. These widely held myths will addressed and some broad principles to guide the development of biomonitoring programs will be discussed.

Methods: The work done in the last decade has been examined in this study.

Conclusion: With biomonitoring, reliable and consistent data on exposure of the population to environmental toxicants can form the basis for health risk assessment and management process, implementation of preventive measures and control of activities, international comparisons and compliance with international standards(agreements and contracts for example; Stockholm agreement). Integration with environmental monitoring of similar environmental pollutants allows better identification of sources and exposure routes and thus better assessment of population exposure.

FULL TEXTS

WORKSHOP

ANALYTIC METHODS IN FORENSIC TOXICOLOGY
PART 1

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1. Brief Description of Forensic Toxicology

Forensic Toxicology is a branch of toxicology dealing with cases and issues where adverse effects of drugs and chemicals on biological systems have administrative or medico-legal consequences [1]. The results might be used in court and therefore, the analytical methods chosen are of critical importance. Typically three cases are considered in forensic toxicology; postmortem, human performance and drug-facilitated crimes along with workplace drug testing.

There is a considerable overlap between forensic and clinical toxicology since both use similar approaches and analytical techniques. Analytical chemistry is a branch of chemistry responsible for characterizing the composition of matter, both qualitatively and quantitatively. It is not limited to a series of analysis on a routine sample but it deals with developing new methods for measuring chemical species [2].

Analytical chemistry has provided many of the tools and methods necessary for research in the other areas of multidisciplinary researches. In order to communicate in a multidisciplinary group, it is important to use correct terminology.

2. Basic Terminology in Analytical Chemistry

The component of interest in the sample is called the analyte and the remainder of the sample is matrix. Any chemical or physical principle we can use to study an analyte is called the technique and usually mixed with method. The latter is the application of a technique for a specific analyte in a specific matrix with a set of written directions telling us how to obtain the sample, handle the interferents, and validate the results for a particular sample which is called procedure. Protocol is a set of guidelines specifying a procedure that must be followed if an agency (i.e. EPA) is to accept the results. Figure 1 shows these terms on an example of investigation of drugs of abuse level in blood.

Analyzing a sample generates a chemical or physical signal (S_A) that is proportional to the amount of analyte in the sample (C_A). with a proportionality constant of k_A [3].

$S_A = k_A C_A$

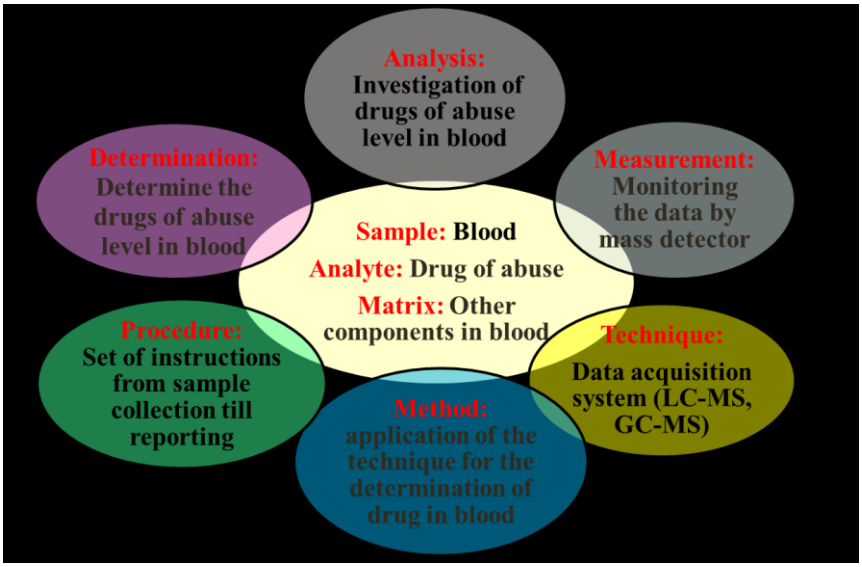

Figure 1. The basic terms of analytical chemistry

Steps in a quantitative analysis follow an order of selection of the method, sampling and storage, sample preparation, measurement, evaluation of the data and writing a report. In selection step; several aspects of the method are considered along with the availability, run time, and the cost of the method [4]. Figure 2 summarizes the details of these steps.

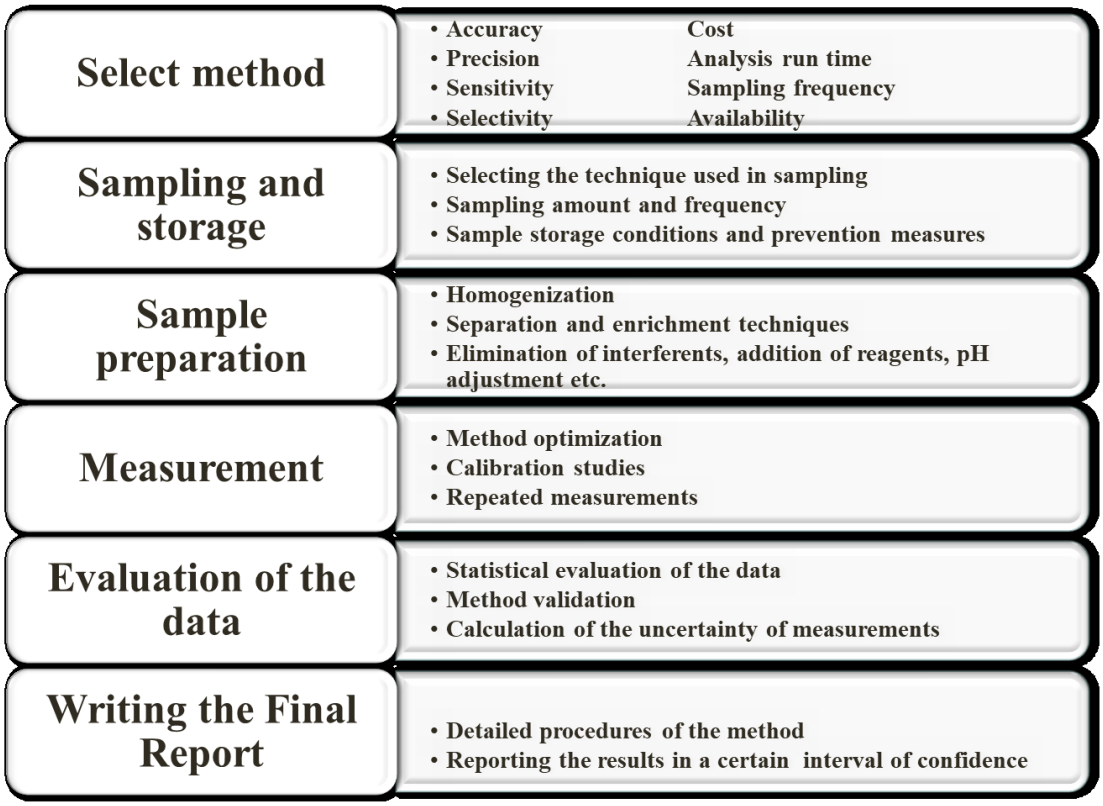

Figure 2. Steps in an analytical method [4]

Accuracy is the term indicating how close the measurement is to the true of accepted value. The difference between them is called the absolute error. Precision is the term how close a series of measurements are to each other. Replication improves the quality of the results and provides a measure of reliability. However, the best way to estimate any bias in an analytical method is to use standard reference materials (SRMs) that contain one or more analytes at known concentration levels [4,5].

Here, it should be mentioned about the difference between population and the sample. A population is the collection of all measurements of interest but, it is not practical or possible in some case. Therefore a sub sample of measurements selected from the population to get an idea about the whole sample.

Three terms are widely used to describe the precision; standard deviation (s), variance (s^2) and coefficient of variation (CV). These are functions on the deviation of the measurement (x_i) from the mean. The population mean (μ) and the population standard deviation (□) is given below along with the sampling mean ($\bar{x}$) standard deviation

$$\sigma = \sqrt{\frac{\sum(x_i - \mu)^2}{n}} \qquad s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

Sensitivity is the ability of the method to establish the difference between the samples those have different amounts of analyte and it is equivalent to the proportionality constant. Sensitivity is often confused with the detection limit which is the smallest amount of analyte that we can determine with confidence.

Generally, the properties measured are characteristic of a group of compounds but some other species called interferences might also affect the measurement. Selectivity defines the method's freedom from interferences. If the signal obtained by the analytical method depends on one analyte only, this means the method is specific to this analyte.

After selection of the method, sampling and separation techniques are chosen according to the sample and the method as well. Survey results for the distribution of time show that analytical chemists spend most of their times on sample preparation. This step is also the prone to errors since it include several physical separation and enrichment procedures.

In the measurement step, a physicochemical parameter such as light absorption, potential or small current produced by the analyte is measured. As part of the validation process, appropriate chemical or physical standards are used to calibrate any equipment being used.. The raw data collected during the experiment are then reduced or transformed to a more readily analyzable form. A statistical treatment of the data is used to evaluate the accuracy and precision of the analysis and to validate the procedure.

3. Validation Studies

According to the Industrial Guidance of International Conference and Harmonization (ICH) validation of analytical method comprises a list of parameters [6]. In practice, it is usually possible to design the experimental work such that the appropriate validation characteristics can be considered simultaneously to provide a sound, overall knowledge of the capabilities of the analytical procedure, for instance; specificity, linearity, range, accuracy and precision.

An investigation of specificity should be conducted during the validation of identification tests, the determination of impurities, and the assay. Identification tests should be able to

discriminate between compounds of closely related structures which are likely to be present. Assay and impurity tests are made by the resolution of the two components which elute closest to each other. For the impurity test, the discrimination may be established by spiking drug substance with appropriate levels of impurities and demonstrating the separation of these impurities individually from the sample matrix. If impurity or degradation product standards are unavailable, specificity may be demonstrated by comparing the test results of samples containing impurities or degradation products to an independent procedure.

A linear relationship should be evaluated across the range of the analytical procedure. For the establishment of linearity, a minimum of five concentrations is recommended and regression analysis is made to estimate the degree of linearity. The range is normally derived from linearity studies and depends on the intended application of the procedure.

Accuracy should be established across the specified range of the analytical procedure. For the drug substance several methods of determining accuracy are available such as the use of a reference material, comparison of the results with another well-characterized procedure. Accuracy should also be assessed on samples spiked with known amounts of impurities and it should be assessed using a minimum of 9 determinations over a minimum of 3 concentration levels covering the specified range.

Precision is classified according to the procedure. Repeatability is the closeness of the subsequent measurements made by the same operator at the same instrument in a same period. It should be assessed using minimum 9 determinations covering the specified range for the procedure or a minimum of 6 determinations at 100 percent of the test concentration. Intermediate Precision should be established depends on the circumstances including days, analysts, equipment, etc. Reproducibility is assessed by means of an interlaboratory trial. Reproducibility should be considered in case of the standardization of an analytical procedure.

Detection Limit (LOD) is usually based on Signal-to-Noise ratio by comparing measured signals from samples with known low concentrations of analyte with those of blank samples and establishing the minimum concentration at which the analyte can be reliably detected. A signal-to-noise ratio of 3:1 is generally accepted. For Limit of quantitation (LOQ) typical signal-to-noise ratio is 10:1.

Robustness is the reliability of an analysis with respect to deliberate variations in method parameters. If measurements are susceptible to variations in analytical conditions such as stability of analytical solutions or extraction time, these conditions should be controlled.

Finally, system suitability testing is an integral part of many analytical procedures. The tests are based on the concept that the equipment, electronics, analytical operations, and samples to be analyzed constitute an integral system that can be evaluated as such. System suitability test parameters to be established for a particular procedure depend on the type of procedure being validated.

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ANALYTICAL METHOD DEVELOPMENT IN FORENSIC TOXICOLOGY

PART 2

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1. Introduction

1.1 Selection of the Analyte and Sample Matrix in Forensic Toxicology

Initial step for the method development in forensic toxicology (FT) is selection of the analyte and the sample matrix [1]. The analytes selected can be composed of structurally related compounds or the compounds with similar pharmacological, but different physicochemical properties can be selected. On the other hand, in some cases such as drug-facilitated sexual assault, a defined list of compounds is searched in the matrix. In a sound analysis in analysis of blood samples in human performance or postmortem toxicology, metabolites should also be involved. However, the major difficulty in the analysis of New Psychoactive Substances (NPS) is the lack of reference standards of the drugs and their metabolites.

The selection of sample matrix is the most crucial part and designates the further steps [1-3]. The common matrixes used in FT are blood, urine, parts of organs, nails, hair, and saliva etc. In many countries, it is mandatory to use blood or plasma, serum for toxicological analysis in the context of driving under the influence of drugs.

The important issue for the selection of sample matrix is about what time the exposure occurred. If the exposure is happened recently, the blood and its products are very useful for the evaluation the case and it is also correlated with the pharmacological effects. For a long term exposure, nail and hair sample are preferred. Urine has also longer detection window and also provides good information for the metabolites. If no certain matrix for analysis is defined by the law, the matrix best suited for the analytical purpose can be chosen and major advantage and disadvantages of the matrixes are taken into account. Blood samples can be hardly adulterated but, it requires invasive collection by qualified stuff. Urine is an easy matrix for collection but, can be readily adulterated. Oral fluid is also easy to collect but, it is prone to contamination and the collection method influences sample pH and drug concentration. Hair and nail samples are easy to collect but, it is difficult to interpret the results.

1.2 Selection of the Separation System

The separation system used in FT toxicology is not only responsible from the selectivity of the analytical method, but also for the sensitivity by diminishing the signal-to-noise ratio. There are many issues to consider in selection of the separation system such as; chemical properties of the analyte, concentration level, matrix components, analysis cost etc. Probably most important issues are chemical properties and concentration level of the analyte. On the other hand, the purpose of the analysis also determines the separation system.

Many analytical methods are dedicated to determine the toxic substances in many biological matrixes such as thin layer chromatography, electrophoresis, gas and liquid chromatography with various detection systems. The chromatographic system provides a unique tool that can combine separation and detection. Thus, the common methods used in FT analyses based on chromatographic techniques. If the analyte is volatile gas chromatography (GC) is the method of choice. In addition, gas chromatography mass spectrometry is golden standard for the verification of drug of abuse.

However, invention of new physcoactive drugs with different chemical structure requires developing new analysis methods. In addition, derivatization and sample preparation process affects the accuracy and precision of the method in gas chromatography. Liquid chromatography is probably most convenient method for non-volatile compounds.

Liquid chromatography is a separation technique for trace amount of nonvolatile, very wide range of organic compounds, such as; drug assays, their metabolites, peptides, proteins, pesticides etc. [4]. This technique, used to separate the components in a mixture, to identify each component, and to quantify each component in analytical chemistry. It relies on pumps to pass a pressurized liquid solvent containing the sample mixture through a column filled with a solid adsorbent material. Each component in the sample interacts slightly differently with the adsorbent material, causing different flow rates for the different components and leading to the separation of the components as they flow out the column. Flow scheme was shown in the **Figure 1**.

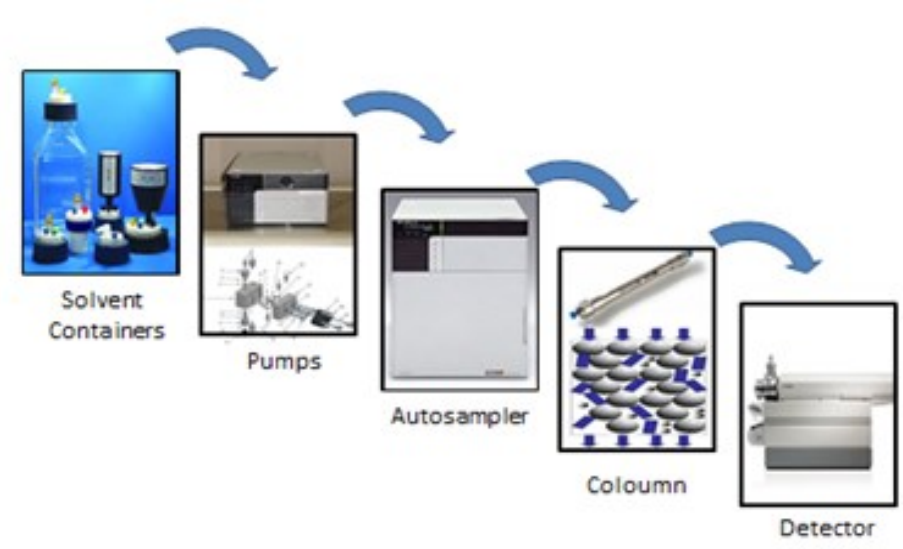

Figure 1 Schematic illustration of LC system [4]

Although many detectors are available for various applications in LC system, mass spectrometers (MS) are superior detectors in terms of selectivity and sensitivity. These detectors works for most compounds across a wide polarity and molecular weight range. It can be tuned to be selective to reduce interference, enhance detection limits and reduce sample preparation.

MS has linear dynamic ranges between 3 and 5 orders of magnitude and can provide information during quantitation in terms of molecular weight and fragmentation pattern. As such, MS is quickly becoming the detector of choice for routine analysis. The advantage of the mass spectrometer is stated that it can provide that absolute identification along with molecular weight of the analyte. Furthermore, the mass spectrometry can be used for identification with a small amount of analyte about in picogram (pg) amounts with high accuracy and precision.

1.3 Selection of the sample pretreatment/preconcentration method

Although, the fast development in analytical technologies undergoes, sample preparation is still emerging step for the analysis. Survey results for the distribution of error generated during sample analysis indicate that the highest part of the error belongs to the sample preparation step. The technique used in this step is very crucial for achieving well defined signal with a higher intensity and protection of analytical device from permanent contamination. Different sample preparation techniques are described for FT in the literature such as; liquid – liquid extraction (LLE), solid phase extraction (SPE), solid phase micro extraction (SPME), etc.

If the sample is diluted and injected into the detection system, the interferents in the matrix will not be removed and the method will suffer from poor selectivity. LLE provides a moderate clean-up but, it is not suitable for polar molecules. In addition, the cost of solvent to obtain and for disposal encourages developing greener alternatives. SPE technique is the best for clean-up and can be automated. The most selective mechanism is the ion-exchange in SPE methodology. Other sorbents commonly used are C8, C18, DVB and HLB cartridges. Other advances in SPE include high affinity sorbents, such as molecularly imprinted polymers (MIPs). But their cost and solvent waste produced limits their use.

QuEChERS (Quick, Easy, Cheap, Effective, Rugged, and Safe) method is originally developed for pesticide residue analysis including several steps such as adding acetonitrile and salt into the weighted sample followed by centrifuging and separation of the supernatant and diluting with the mobile phase before injecting into the LC-MS system. Recently, this technique is becoming popular in forensic toxicological analysis since it minimizes the solvent consumption and produce reliable results.

2. Conclusion

Although there are many routine procedures for FT analysis, method development is very emerging era for achieving sensitive, selective, accurate and precise analysis. Discovery of new drug of abuses, in particular, forces us to develop a new method for their qualitative and quantitative analysis as soon as possible. For the development of method, it is very important designate the chemical (polarity, acidity of molecule) and pharmacological (pharmacokinetic and metabolites) properties of analytes. Thus, the contribution of analytical chemists, pharmacologist and toxicologist is very important.

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O-05 FOOD FORENSICS: A GLIMPSE OF ELEMENTAL CONTENTS OF HERBAL TEAS- PRELIMINARY DATA

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Complementary and alternative medicines have been in focus for thousands of years, and use of herbal products has been tremendously expanding worldwide (1). Some of these products may contain a number of contaminants including metals, which may cause toxicity esp. when consumed in large amounts. Food contaminants are defined as substances that have not been intentionally added to food, which may be present in food as a result of various stages of production, packaging, transport or holding, or might result from environmental contamination (2). Among these contaminants, toxic elements may contaminate the herbal products through polluted soils, pesticides or industrial emissions. Processing and storage conditions may also contribute to higher metal concentrations (3). Although contamination with heavy metals has been well-known, the possible role of herbal medicines in the mechanism of death in cases that come to medicolegal attention has recently been in focus (4, 5). Actually, the term "Food Forensics" involves use of powerful scientific methods for authentication and traceability of foodstuffs (6). Inductively Coupled Plasma Mass Spectrometry (ICP-MS) has become the method-of-choice in multi-element analysis, due to its distinctive features including sensitivity, accuracy, precision, and speed as well as its wide linear-dynamic range. ICP-MS is widely used in interdisciplinary studies and it has become a valuable tool for diverse disciplines, including health, forensic, material, and nuclear sciences (7).

In this study, our aim was to contribute to the product safety issue in a "Food Forensics" frame. Here, we report our preliminary results of a study on elemental composition of 3-sets of herbal teas including samples for winter ailments, as well as so-called "slimming or form teas" and other mixed-herbal teas including lactating-mother formulas. The samples presented herein were selected with regard to their potential consumption rates. A total of 16 different commercial samples in groups of herbal tea bags, namely winter (n=5), form (n=5) and mixed-herbal tea blends (n=6), were obtained. Each sample was homogenized using agate mortar and pestle. For each sample, 250 mg was accurately weighed, and digested with HNO_3 + water

+30% H_2O_2 in a microwave digestion system. An ICP-MS (Agilent 7500a) was used for determination of aluminum (Al), manganese (Mn), nickel (Ni), cadmium (Cd), and lead (Pb) contents of samples under validated conditions.

Our results showed that some herbal tea samples contained higher concentrations of Al (samples: #4,8,14), Mn (samples: #3,6,15), Ni (samples: #2,11,15), and Pb (samples: #3,8,12) as compared with other samples. Interestingly, Cd levels were under the limit of detection in all samples. Current findings regarding group-based comparison revealed that mixed-herbal blends contained slightly higher levels of Al and Mn than those of winter and form tea samples (Figure 1). The content of Al in the herbal tea samples varied between 26.55 mg/kg (form-group) and 220.43 mg/kg (mixed-group). Previous studies report wide concentration ranges of Al in diverse samples (8-11), hence Al content warrants further studies. Mn concentrations in samples ranged from 15.64 to 188.14 mg/kg (mixed-herbal tea group), in line with previous reports (9, 12). As illustrated in Figure 2, samples from winter and form tea groups generally contained comparable amounts of Ni, whereas 3 mixed-tea samples had higher concentrations (max. 1.07 mg/kg).

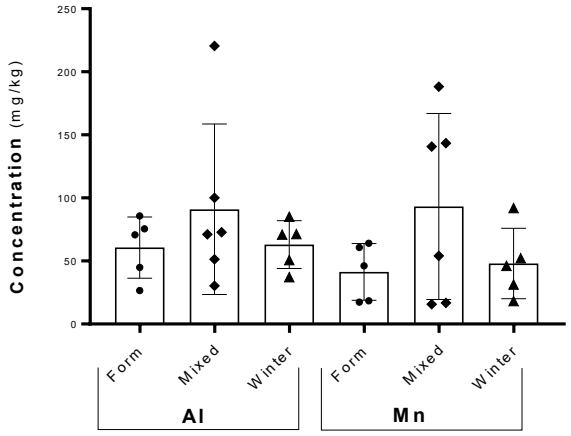

Figure 1. Al and Mn concentrations in samples

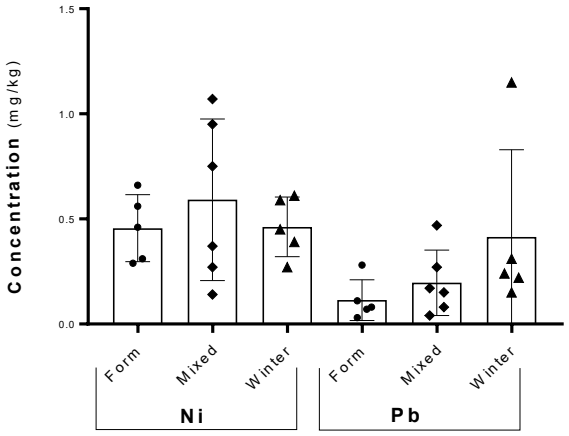

Figure 2. Ni and Pb concentrations in samples

On the other hand, Pb content of some winter tea samples were slightly elevated than those of other groups (Figure 2). Data showed that samples contained Pb concentrations in the range of 0.03 mg/kg (form tea)-1.15 (winter tea) mg/kg, generally in accordance with previous reports (9, 13). However, an association between maternal and cord blood Pb concentrations and green or herbal tea consumption in a Canadian study (14) highlights the possibility of a

potential link. Thus, while the potential for higher blood Pb levels with low-to-moderate tea consumption does not appear to raise health concerns; frequent and high herbal tea consumption along with other sources/factors need to be further considered in specific populations.

Today, food is distributed globally, and often travels a long distance from producer to consumer, usually with various steps until use, making it difficult to trace back (15). Moreover, contaminants are invisible to consumers who assume that these products are totally natural and beneficial. Therefore, current data supports importance of regulation and monitoring of herbal preparations as highlighted previously (3, 16), since excessive use of herbal products may contribute to increased exposure to metals.

Key words: Food forensics, Herbal tea, ICP-MS, Metals

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O-06 THE OCCURRENCE AND SEASONAL VARIATIONS OF COCAINE AND ITS MAIN METABOLITE BENZOYLECGONINE, IN SEYHAN RIVER, TURKEY

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INTRODUCTION

Illicit drugs abuse is an important problem in our society. The consumption of illicit drugs can cause mortality, morbidity, criminality, economic damage and social insolation etc.(1). In present-day society, illicit drugs are widely used, and furthermore, cocaine is one of the preferred drugs of abuse. The recreational use of cocaine has increased dramatically over the last 25 years as a result of increased availability and lowering prices(2). Although the number of cocaine users is decreasing or stabilizing in parts of Europe, wastewater analysis suggests that cocaine consumption in that region may be increasing (3).

Illicit drugs and metabolites have been accepted as environmental emerging pollutants in recent years(4). Following consumption, illicit drugs and their metabolites are continuously released into the aquatic environment because of their partial elimination in wastewater treatment plants (WWTPs) and, according to their physicochemical properties. Only 1–9% of a cocaine dose is excreted in urine unchanged, while 35–54% is excreted as benzoylecgonine. Unlike cocaine, its main metabolite benzoylecgonine has high stability under various conditions in the environment(5). The pathways for cocaine and metabolites entering into the environment are these; the abuse of cocaine and excretion, the combination of improper disposal of unused medicines and illegal manufacturing discharges(6).

Determination of these compounds in the environment is an indirect tool to estimate the community level consumption of cocaine and to evaluate potential eco-toxicological impacts. Consequently, the abuse of cocaine has been monitored through the analysis of cocaine and its metabolites in various biological matrices e.g. serum/whole blood or urine. However, these analyses are generally performed on persons with a high degree of intoxication or on suspected drug users. Nevertheless, the extent of the cocaine use by the general population remains largely unknown. Recently, more direct and realistic approaches have been proposed based on the measurement of urinary excreted drugs and metabolites, in local waste and surface water.

The aim of this study was to detect regional and seasonal variations of cocaine and benzoylecgonine in Seyhan River, Adana, by using solid phase extraction and a sensitive liquid chromatography-tandem mass spectrometry (LC-MS/MS) screening method for the analysis of cocaine and benzoylecgonine in surface water.

MATERIALS AND METHODS

Sampling Area

Seyhan River was selected as the sampling area. 7 stations were chosen between the exit of Seyhan Dam Lake and entering of the Mediterranean Sea. Surface water samples were taken seasonally, over the periods of December 2016 to November 2017. SEY-01 and SEY-02 stations were under the influence of domestic and industrial pollutants, SEY-03 and SEY-04 stations were under the influence of agricultural pollutants, and SEY-05, SEY-06 and SEY-07 stations were under the influence of pollutants from domestic, agricultural and especially wastewater treatment plants.

Sample Preparation and LC-MS/MS Analysis

Guzel et al., (2018)'s solid phase extraction (SPE) method was used for the SPE analysis (7). 1 L river water sample filtered with GF/F Whatmann glass fibre filters and acidified. Then, internal standards cocaine-*d3* and benzoylecgonine-*d3* was added to the samples. OASIS HLB (5cc, 60 mg) cartridges were used for the SPE. After then extracts were dried under gentle nitrogen and re-dissolved with 1ml methanol. Cocaine and benzoylecgonine analysis were performed by using LC-MS/MS instrument (Shimadzu 8040). LC-MS/MS parameters established for the MRM acquisition mode were given in Table 1.

Table 1. LC-MS/MS parameters established for the MRM acquisition mode

Drug Name	Ret. Time (min)	Precursor (m/z)	Product-1 (m/z)	CE-1 (V)	Product-2 (m/z)	CE-2 (V)
Cocaine	10.30	304.20	182.10	-18	82.10	-30
Cocaine-*d3*	10.81	307.20	185.20	-22	85.10	-33
Benzoylecgonine	4.79	290.10	168.10	-19	105.10	-30
Benzoylecgonine-*d3*	4.88	292.60	171.10	-21	108.10	-48

CE= collision energy

RESULTS AND DISCUSSION

Cocaine was detected at any seasons and stations in Seyhan River. After cocaine usage, only a small amount of cocaine is excreted unchanged in the urine, and cocaine has low stability under environmental conditions. This may be the reason why the cocaine was not detected in the Seyhan River.

Worldwide cocaine and benzoylecgonine concentrations from different countries in surface waters were shown in Table 2. Cocaine was not detected in Seyhan River. To our knowledge in Turkey, there are no studies about the detection of cocaine and benzoylecgonine in surface waters. Highest cocaine concentrations were detected in Belgium (37 ng/L) (1), and the lowest concentrations (2 ng/L) in surface waters were detected in England (8).

Benzoylecgonine has higher stability than cocaine under various conditions in the environment. Benzoylecgonine was detected in 36% of the studied samples of this study. Benzoylecgonine concentrations of Seyhan River were given in Figure 1. Benzoylecgonine concentrations were between 0.16-0.50 ng/L, and it was detected in SEY-05, SEY-06 and SEY-07. The highest concentrations were detected in the SEY-06 station which is under the influence of WWTPs effluents of Adana Province. Benzoylecgonine concentrations were higher in the summer season.

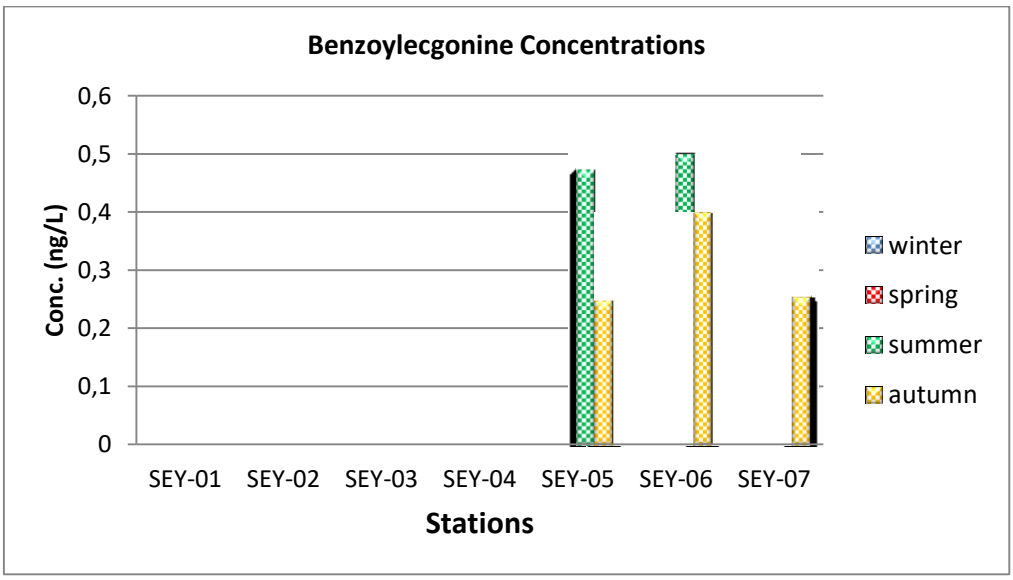

Figure 1. Benzoylecgonine concentrations in Seyhan River

In Seyhan River average benzoylecgonine concentration was 0.32 ng/L. Benzoylecgonine concentration was quite low compared to other countries in the literature. The

highest benzoylecgonine concentrations were detected in surface waters in Belgium (9) and Spain (10).

It is not enough to compare cocaine usage quantities only by measuring concentrations in river waters. These studies should also be supported by waste water studies. Conducting comparisons with other countries and/or cities by using concurrent samples will provide more accurate results.

Table 2. Worldwide concentrations of cocaine and benzoylecgonine in surface waters

	Conc. (ng/L)	Country	References
Cocaine	1.5	Italy	(11)
	10.0	Spain	(10)
	2	England	(8)
	13	Belgium	(12)
	29	Ireland	(13)
	22	Belgium	(9)
	37	Belgium	(1)
	nd	**Turkey**	**This study**
Benzoylecgonine	44	Belgium	(12)
	84	Belgium	(9)
	77	Spain	(10)
	7	Belgium	(1)
	0.32	**Turkey**	**This study**

CONCLUSSION

Because of the incomplete elimination of these compounds in WWTPs, they can be detected in environmental compartments. These illicit drugs can be biologically active, in the low ng/L range in surface waters, and may therefore cause negative effects on the biota continuously exposed to them.

Future studies for illicit drug studies in the aquatic environment needs are to detect different types of drugs (e.g. cannabis, ecstasy, amphetamine) in waters and to make monitoring studies in surface waters and wastewaters permanent. Effects of illicit drugs on aquatic organisms are not known well. So the toxic effects of these pollutants on organisms should be investigated more. There are very limited studies about the detection of pharmaceuticals in surface waters in Turkey.

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O-09 MULTI-RESIDUE ANALYSIS OF SELECTED NEW PSYCHOACTIVE SUBSTANCES IN WASTEWATER SAMPLES BY LIQUID CHROMATOGRAPHY–TANDEM MASS SPECTROMETRY-A PRIMARILY STUDY

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INTRODUCTION

New Psychoactive Substances (NPS) have been known in the market by terms such as "legal highs", "bath salts" and "research chemicals". UNODC defined this NPS term as "substances of abuse, either in a pure form or a preparation, that are not controlled by the 1961 Single Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances, but which may pose a public health threat"(1).

The use of NPS is often linked to health problems. In general, side effects of NPS range from seizures to agitation, aggression, acute psychosis as well as potential development of dependence. NPS users have frequently been hospitalized with severe intoxications. Safety data on toxicity and carcinogenic potential of many NPS are not available or very limited, and information on long-term adverse effects or risks are still largely unknown. Purity and composition of products containing NPS are often not known, which places users at high risk as evidenced by hospital emergency admissions and deaths, sometimes associated with poly-substance use (1).

New psychoactive drugs were detected in the European Union (EU) at a rate of around one per week in 2011 (49 new substances)(2) and are typically detected through the EUs Early Warning System. These new substances are exclusively synthetic and typically dominated by synthetic cannabinoids and cathinones(3). New Psyhoactive Substances by effect group were shown in Figure 1.

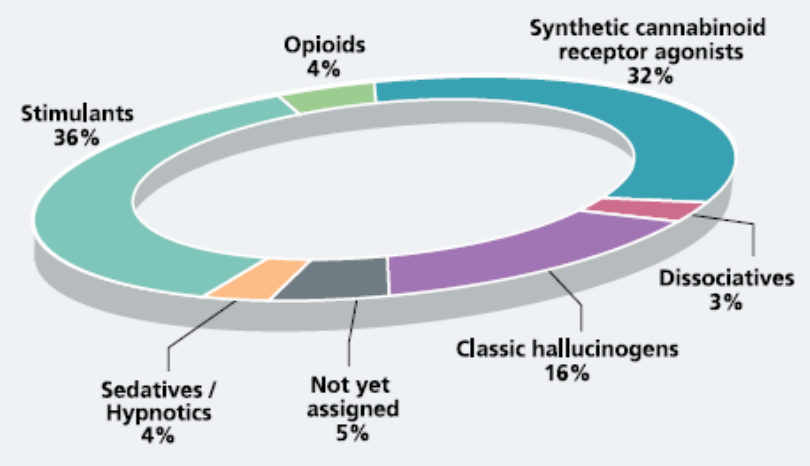

Figure 1: New Psyhoactive Substances by effect group (1)

Relevant epidemiological information about lifestyle habits, public health and wellbeing can be obtained from the chemical analysis of urban wastewater. This approach, called wastewater-based epidemiology (WBE), is based on the analysis of specific human metabolic excretion products (biomarkers) in wastewater as indicators of consumption or exposure of the population served by the sewer network under investigation to different substances. WBE has been successfully applied as a suitable approach for the estimation of illicit drugs consumption (4).

The principle behind wastewater-based epidemiology (WBE) derives from the fact that parent compounds and/or their human metabolites (i.e., drug residues) are excreted in urine and faces following illicit drug use and end up in urban sewer systems (5). The European Monitoring Centre for Drug and Drug Addiction (EMCDDA) has recently acknowledged the added value of WBE to socio-epidemiological methods, such as population surveys, seizure data and crime statistics, in generating useful and relevant data on population drug use (2).

The analysis of specific metabolic target residues in urban wastewater was proposed as a complementary tool to assess the use of illicit drugs (6), and this approach was applied with promising results (7–9). It can be employed to evaluate the use of NPS but poses some challenges (10). Firstly, concentrations in wastewater are expected to be very low on account of the limited use of these substances; secondly, their metabolism in the human body is mostly unknown, so it is hard to identify proper target residues for wastewater monitoring; and finally, their behavior/stability in sewage water is still largely unknown(11).

Although the interpretation of quantitative results should be done carefully for NPS due to the lack of metabolic information, the qualitative monitoring could lead to a better understanding of the frequency of use and could identify changes in consumption(4).

The aim of the study is development a rapid and sensitive validated method for the determination of 59 priority NPSs and their metabolites, synthetic cathinones, cannabinoids, and triptamines are included.

MATERIALS AND METHODS

Sample Preparation

In the study, 100 ml pure water was used as negative matrix. Pure water samples were acidified with 1M HCL, for adjust pH to 2±0.5. Then, reference standard mix and internal standard added to acidified matrix sample. Solid phase extraction with OASİS HLB cartridges was performed. The samples were evaporated under gently nitrogen gas to dryness at room temperature. Then samples were reconstituted in 1 ml methanol:water (10:90) mixture and given to liquid chromatography-tandem mass spectrometry (LC-MS/MS) device.

LC-MS/MS Analysis

NPSs analysis were performed by using LC-MS/MS device (Shimadzu 8040). LC-MS/MS paameters established fot the MRM acquisition mod were given in Table 1.

Tablo 1: LC-MS/MS parameters for the MRM acquisition mode

	Compounds	Ret. Time	Precursor Ions	Product Ions	CE	ESI
1	(S)-AB-FUBINACA	9,77	369.10, 324.10	369.10, 109.00	-44	+
2	5-FADBICA	9,87	362.10, 232.10	362.10, 144.00	-43	+
3	5-Methoxy MIPT	5,57	247.10, 86.10	247.10, 130.10	-15	+
4	5F-ADBICA	9,87	362.10, 232.10	362.10, 144.00	-22	+
5	AB-CHIMINACA	10,73	357.30, 241.10	357.30, 312.20	-27	+
6	AB-CHIMINICA_M1A	8,79	373.30, 257.10	373.30, 356.20	-19	+
7	AB-CHIMINICA_M3A	8,16	374.30, 257.10	374.30, 145.10	-39	+
8	AB-FUBINACA-2A	8,15	399.20, 109.00	399.20, 253.10	-47	+
9	AB-FUBINICA_2B	8,13	399.00, 109.00	399.20, 382.20	-54	+
10	AB-PINACA	10,32	331.30, 215.10	331.30, 286.20	-26	+
11	AB-PINACA N-4-hydroxypentyl	8,57	347.10, 213.10	347.10, 302.10	-30	+
12	AB-PINACA Pentanoic acid	7,44	361.30, 316.20	361.30, 344.10	-32	+

13	AB-PINACA_N-(5-hydroxypentyl)	8,53	347.20, 330.20	347.20, 301.90	-38	+
14	ADB-FUBINACA	10,21	383.30, 109.00	383.30, 253.10	-50	+
15	AKB-48-N-5-OH-Pentyl	11,15	382.30, 135.10	382.30, 79.20	-23	+
16	AKB-48-N-PA	10,47	396.30, 135.15	396.30, 79.10	-21	+
17	AKB-48-N (4-fluorobenzyl)	11,89	404.30, 135.10	404.30, 107.10	-54	+
18	AM-2201	10,81	360.10, 155.05	360.10, 127.10	-27	+
19	AM-2201-6-OH-indol	9,95	376.10, 155.05	376.10, 127.05	-26	+
20	AM-2201-4-OH-Pentyl	9,95	376.10, 127.05	376.10, 155.10	-49	+
21	JWH-018	10,50	342.00, 155.05	342.00, 127.05	-24	+
22	JWH-018 OH	9,02	358.20, 155.10	358.20, 127.10	-20	+
23	JWH-018-N-pentanoic acid	9,32	372.20, 155.10	372.20, 127.10	-25	+
24	JWH-073	11,22	328.25, 127.00	328.25, 155.10	-24	+
25	JWH-073 OH	9,80	344.20, 155.10	344.20, 127.10	-20	+
26	JWH-073-N-(4-Hydroxybutyl)	9,80	344.00, 155.00	344.00, 127.00	-24	+
27	JWH-073-N-Butanoic acid	8,98	358.20, 155.00	358.20, 230.00	-25	+
28	JWH-081	11,67	372.10, 185.10	372.10, 157.10	-25	+
29	JWH-081-4-OH-NAPHTYL	11,08	358.10, 171.10	358.10, 115.10	-25	+
30	JWH-081-N-5-OH-PENTYL	10,33	388.30, 185.00	388.30, 157.05	-25	+
31	JWH-122	11,75	356.30, 169.00	356.30, 141.15	-26	+
32	JWH-122-4-OHP	10,46	372.10, 169.10	372.10, 141.10	-24	+
33	JWH-122-N-5-OH	10,44	372.10, 169.05	372.10, 141.15	-22	+
34	JWH-200	10,14	385.30, 155.10	385.30, 114.10	-23	+
35	JWH-201	11,14	336.10, 121.15	336.10, 135.00	-27	+
36	JWH-203	11,38	340.20, 125.00	340.20, 214.15	-29	+
37	JWH-203-N-P-A	9,13	370.20, 125.00	370.20, 200.05	-30	+
38	JWH-210	11,97	370.30, 183.10	370.30, 214.15	-27	+
39	JWH-210-5-OH-Pentyl	10,72	386.30, 183.05	386.30, 155.10	-23	+
40	JWH-210-5-OH-indol	10,88	386.30, 183.05	386.30, 230.10	-29	+
41	JWH-210-N-4OHP	10,69	386.30, 183.15	386.30, 155.10	-26	+
42	JWH-210-N-P-A	10,03	400.10, 183.05	400.10, 155.15	-26	+
43	JWH-250	11,18	336.10, 121.15	336.10, 91.15	-21	+
44	JWH-250-4-OH-Pentyl	9,70	352.10, 121.10	352.10, 91.05	-23	+
45	JWH-250-5-OHP	9,70	352.10, 121.15	352.10, 91.15	-22	+
46	JWH-398-N-5-OH-Pentyl	10,78	392.20, 189.00	392.20, 161.00	-23	+
47	JWH-398-NPA	10,09	406.20, 188.95	406.20, 161.00	-23	+
48	MBDB.HCl	6,11	208.00, 77.00	208.00, 135.00	-44	+
49	RCS-4	11,14	322.20, 135.00	322.20, 77.05	-24	+
50	RCS-4-5-0H-Pentyl	9,58	338.20, 135.05	338.20, 77.05	-21	+
51	RCS-4-N-5-Carboxypentyl	8,65	352.20, 135.05	352.20, 77.10	-23	+
52	RCS-8	11,86	376.30, 121.05	376.30, 91.05	-26	+
53	UR-144	11,79	312.30, 125.15	312.30, 55.05	-23	+
54	UR-144-N-5-OH-Pentyl	10,59	328.30, 125.15	328.30, 55.20	-20	+
55	UR-144-NPA	9,81	342.30, 125.15	342.30, 55.10	-22	+
56	WIN-55212-2	10,67	427.30, 155.15	427.30, 127.10	-25	+
57	XLR-11	11,16	330.30, 125.15	330.30, 55.10	-23	+

58	XLR-11-6OH-indol	10,41	346.30, 125.10	346.30, 55.20	-23	+
59	XLR-11-N-4-OHP	10,18	346.30, 248.10	346.30, 144.00	-22	+
60	JWH-073 d7	10,27	335.30, 127.10	335.30, 155.05	-47	+

CE= collision energy, ESI= electrospray ionization mode

RESULTS AND DISCUSSION

59 target compounds and metabolites were selected for this study. These compounds were selected on the basis of their frequent detection in toxicological, forensic and analytical studies which reported by EMCDDA and UNODC. 36 of the 59 target analytes were selected as the target substance in this study and were recovered by this method. 12 of 59 target analytes had high recoveries (>40%) (Table 2). 24 of 59 target analytes had lower recoveries (<40%). 23 target analytes were not detected by using this method.

Reid, Derry, & Thomas, (2014) showed at their study, recoveries for seven synthetic cannabinoids were between 31 and 71% in wastewater (3). González-Mariño, Thomas, & Reid, (2018) showed at their study, recoveries for four synthetic cannabinoid metabolites were between 59 and 138% in wastewater (12). Bade et al., (2017) showed at their study, recoveries for ten NPSs was between 70 and 120% (13).

Tablo 2: NPSs with high recoveries

	Compounds	**Ret. time**	**R^2**	**LOD**	**LOQ**	**Recovery (%)**
1	AKB-48-N-PA	10,47	0,997	0,56	1,7	46
2	AM-2201-6-OH-indol	9,95	0,991	0,47	1,42	44
3	JWH-018 OH	9,02	0,999	0,29	0,89	66
4	JWH-018-N-pentanoic acid	9,32	0,998	0,08	0,25	59
5	JWH-073 OH	9,80	0,993	0,8	2,43	40,3
6	JWH-073-N-(4-Hydroxybutyl)	9,80	0,997	0,31	0,93	52,3
7	JWH-073-N-Butanoic acid	8,98	0,998	0,28	0,83	64,4
8	JWH-122-N-5-OH	10,44	0,998	0,17	0,52	48
9	JWH-203-N-P-A	9,13	0,992	0,27	0,81	44
10	JWH-398-NPA	10,09	0,996	0,03	0,1	44,4
11	RCS-4-5-0H-Pentyl	9,58	0,999	0,16	0,49	63,9
12	RCS-4-N-5-Carboxypentyl	8,65	0,995	0,05	0,15	79,5

CONCLUSSION

Primarily study for validating a new sensitive analytical method based on LC-MS/MS was made for the determination of 59 NPSs of synthetic cathinone, cannabinoid and triptamines. The method base on SPE step using OASIS HLB cartridges prior to the determination by LC-MS/MS.

Method studies will be continued and a fully validated, obtaining satisfactory accuracy and precision will be made. Different SPE cartridges, columns, solvents and mobile phases are going to use to increase recoveries.

It is aimed to analysis the wastewater samples in the Adana region Turkey, to determine the types of NPSs used.

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O-10 MULTIPLE DRUG USE PROFILE IN IZMIR/TURKEY

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INTRODUCTION

Drug abuse is a topical issue all over the world. It is a health & safety problem with a significant impact on health and society. Because of their physiological and socio-economic vulnerability, adolescents and youth are a high-risk group for drug addiction and an easy prey for drug dealers. According to estimates of drug use in European Union in 2018, cannabis last year use was 24.0 million, cocaine was 3.5 million and amphetamine type stimulants (ATS), opioids, new psychoactive substances uses were following them (1). Turkey is important as a transit country between Europe and the Middle East and also represents a large consumer market. Located on the Balkan route, it is a key transit point for illicit drugs. According to the Turkey Country Drug Report 2017, in young adults cannabis use was 0.4% in the last year (2). Multiple drug use among people is great concern globally given the associated substantial physical and mental health problems. Although multiple drug abuse often refers to abuse of multiple illicit drugs, it's also inclusive of prescription medications used in nonmedical circumstances. But we have limited data about prevalence of multiple drug use. According to the ESPAD 2003 which represents use of selected illicit drugs during the last month among cannabis users and among all 15 to 16-year-old school students in the clusters of low, medium and high prevalence countries, ecstasy, amphetamines, magic mushrooms use were common in medium prevalence countries among cannabis users (3). Probation system is regulated The Turkish Penal Code, which was updated in 2014, with further adjustments in 2015, specifies prison sentences of two to five years for those who use drugs or buy, receive or possess drugs for personal use. There is also the option of treatment and/or probation of up to three years, although, since 2014, probation as an alternative to prison cannot be used more than once. According to the probation system, the substance should be negative in the urine samples.

The purpose of this study was to determine the frequency of illegal substance and multiple drug use by evaluating toxicological results of the probation and clinical cases who were admitted to Ege University, Institute on Drug Abuse, Toxicology and Pharmaceutical Science (BATI), Addiction Toxicology Laboratory.

METHODS

Urine samples of 14.122 cases who admitted from probation system and various departments of hospital analyzed by enzymatic immunoassay between 2016-2017. Urine samples were analyzed for cannabis, amphetamine type stimulants (ATS), cocaine, opiates, benzodiazepine, buprenorphine, synthetic cannabinoids (JWH 018, JWH 073, AM 2201, UR 144), 6-monoacetyl morphine (6-AM) and Ethyl glucuronide (EtG). Toxicological analysis results of the cases were obtained by retrospective examination of the hospital automation system and evaluated statistically (Pearson Chi-Square).

RESULTS

30, 2% (n=4265) of the total cases (n=14122) were positive. 49, 14% (n = 2096) of the drug positive cases were from probation and 50,86% (n=2169) were from clinical cases. Single drug was detected 81% (n=3453) of the positive cases and multidrug was detected in 19% (n=812). When we look at the distribution in years, the most positive case is in March. The most commonly detected drug in probation and clinical cases is cannabis. Multiple drug was detected in 17, 13% (n=359) of probation cases and 20, 88% (n=453) of clinical cases (Figure 1).

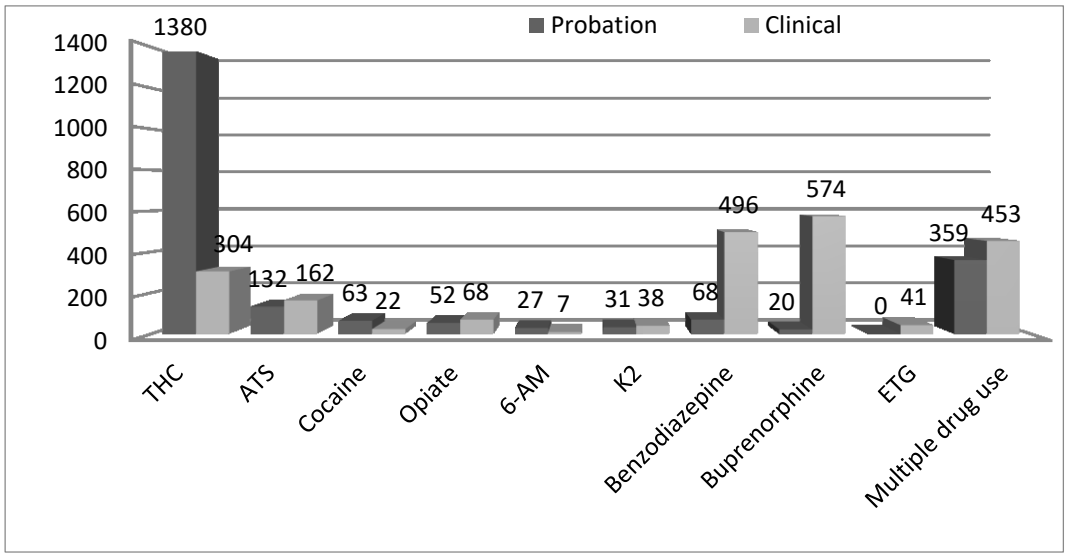

Figure 1. Positive drug results belong to probation and clinical cases

When multiple drug combinations were considered, the most common drugs were cannabis with ATS in probation cases and opiate with buprenorphine were detected in clinical cases (Figure 2).

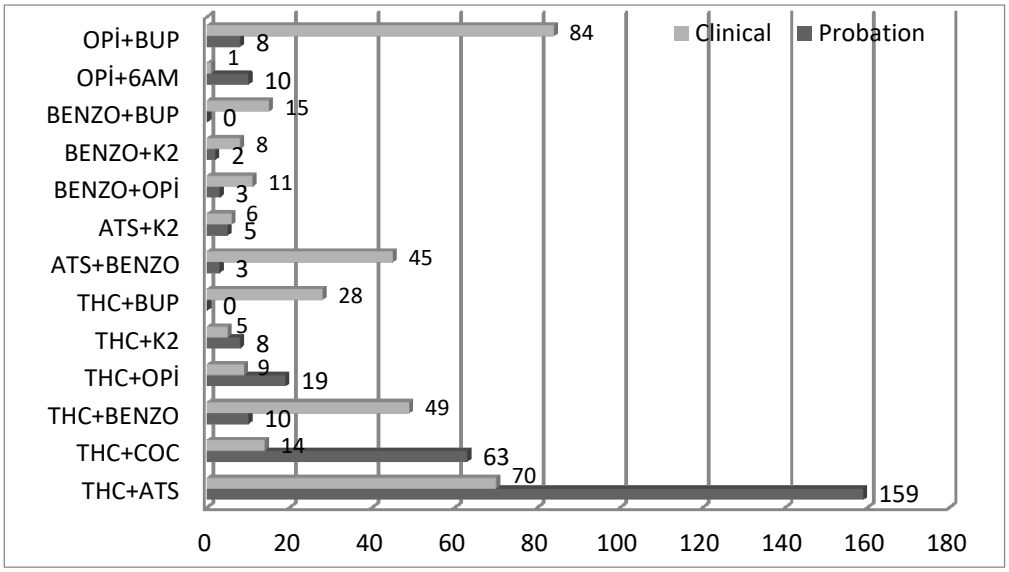

Figure 2. Multiple drug combinations in probation and clinical cases

Multiple drug was detected in 19,6% (n=444) of the positive cases in 2016 while in 2017 this rate was 18,4% (n=368) and no significant difference was found between them (p=0.244).

DISCUSSION

The collection of valid and reliable data on drug use is very important in identifying problems and creating effective policies. In this context, toxicological analysis data play a significant role. The use of several drugs by an individual over a longer period of time might reflect the replacement of one drug by another, due to changes in price, availability, legality or fashion. The fact that multiple drugs are among the most commonly used drugs is an issue to be emphasized. Because of the most commonly detected drugs and involved in multiple drug combinations, it is given rise to though that cannabis and amphetamine type stimulants may be a step in the transition to multiple drug use. Buprenorphine and benzodiazepine are prescribed medications used in the treatment of drug abuse and may limit the statistical evaluation of drug use. The presence of benzodiazepine in multiple drug combinations suggests that there may be abuse as well as treatment.

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O-12 EVALUATION OF CASES USING MARIJUANA BETWEEN 2011-2015 YEARS IN TRABZON, TURKEY

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1.Introduction

In the 20th century, marijuana has been used more for its euphoric effects than as a medicine. Its psychological and behavioral effects have concerned public officials since the drug first appeared in the southwestern and southern states during the first two decades of the century. By 1931, at least 29 states had prohibited use of the drug for nonmedical purposes(1). In the late 1960s and early 1970s, there was a sharp increase in marijuana use among adolescents and young adults. Marijuana plants have been used since antiquity for both herbal medication and intoxication (2). Marijuana is the common name for Cannabis sativa, a hemp plant that grows throughout temperate and tropical climates. The most recent review of the constituents of marijuana lists 66 cannabinoids. Δ9-tetrahydrocannabinol (Δ9-THC) is the primary psychoactive ingredient; depending on the particular plant, either THC or cannabidiol is the most abundant cannabinoid in marijuana (3,4).

Marijuana (cannabis) use represents a significant public health challenge in developed countries across the globe, including the Turkey. It is the single most commonly used illicit drug among Turkey youth; the prevalence of marijuana use continues to increase despite the increases in the perceived harm of marijuana. Documented studies indicate that marijuana use can start at a very young age (5-7). The health burden of marijuana use is substantial because of a number of negative consequences of early marijuana exposure, including developmental, neurocognitive, psychosocial, and behavioral problems(8,9). The aim of this study was to determine the presence of marijuana and drug abuse in the Eastern Black Sea Region during five year period.

2.Methods

A retrospective evaluation was made of 2446 cases sent to the Chemistry Department of Trabzon Branch of the Council of Forensic Medicine by the surrounding province Prosecutor's Office because of drug use between 1 January 2011 and 31 December 2015 years. Cases were evaluated in respect of age, gender, level of education, occupation, and the type of drug used. Blood and urine specimens were analysed by Enzyme Immunoassay (CEDIA) and

Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS). Statistical evaluation of the data obtained was performed using SPSS 13.0

3.Results

Of the 2446 cases determined to have used marijuana, 2389 (97.7%) were male and 57 (2.3%) were female. The mean age was 29.3±9.3 years for males and 23.7±7.2 years for females. The youngest and oldest male were 13 and 65 years of age, the youngest and oldest female were 13 and 40 years of age, respectively. The age ranges of the males were 509 (21.3%) cases in the 13-22 years age group, 975(40.8%) cases in the 23-32 years group, 474 (19.8%) cases in the 33-42 years group, 285(11.9%) cases in the 43-52 years group, and 146 (6.1%) cases in the 53-62≥ years age group. The females were found to be 20(35.1%) cases in the 13-22 years age group and 35(61.4%) cases in the 23-32 years age group, and 2(3.5%) in the 33-42 years group.

Table 1. Demographic characteristics

Demographic characteristic	Female Number (%)	Male Number (%)	Total(%)
Gender	57(2.3)	2389(97.7)	2446(100)
Age (mean±SD)	23.7±7.2	29.3±9.3	
Age range (years)			
13-22	20(35.1)	509(21.3)	529(21.6)
23-32	35(61.4)	975(40.8)	1010(41.3)
33-42	2(3.5)	474(19.8)	476(19.4)
43-52	-	285(11.9)	285(11.6)
53-62 ≥	-	146 (6.1)	146(6.0)
Education level			
Primary school	33(57.9)	1421(59.5)	1454(59.4)
High school	20(35.1)	904(37.8)	924(37.8)
University	4(7.0)	35(1.5)	39(1.6)
Reading -writing only	-	29(1.2)	29(1.2)
Employment status			
Unemployed	25(43.8)	1217(50.9)	1242(50.8)
Casual employees	14(24.6)	700(29.3)	714(29.2)
Regular work	5(8.8)	336(14.1)	341(14.0)
Student	8(14.0)	117(4.9)	125(5.1)
Farmer	-	14(0.58)	14(0.6)
Civil servant	-	5(0.21)	5(0.2)
Housewife	5(8.8)	-	5(0.2)

When the cases were evaluated according to the level of education, 1454(59.4%) cases were primary school, 924(37.8%) high school, 39(1.6%) university and 29(1.2%) only had a basic level of literacy. Employment status was examined and it was seen that 1242(50.8%) were unemployed, 714(29.2%) were in casual employment, 341(14.0%) were in regular employment, 125(5.1%) were student, 14(0.6%) were in farmer, 5(0.2%) were in civil servant, and 5(0.2%) were in housewife (Table 1).

According to the analysis results of the 2446 cases, while marijuana were determined in 2052 cases, it was determined together with other substances (synthetic cannabinoids, ecstasy, heroin, cocaine, benzodiazepine, anti-depressants, anti-psychotics) in 394 cases. The details of these substances are shown in Table 2.

When the use of marijuana was evaluated by year, the prevalence of marijuana use showed increase from 2013 to 2015 (Fig. 1).

Table 2. Distribution of the drugs used

Drugs	**n**	**%**
Cannabis (marijuana)	2052	83.9
Cannabis+SC*	201	8.2
Cannabis+Ecstasy	75	3.1
Cannabis+Ecstasy+SC	60	2.4
Cannabis+SC+Amphetamine	22	0.9
Cannabis+Heroin	3	0.1
Cannabis+Cocaine	2	0.08
Cannabis+other drugs**	31	1.26
Total	2446	100

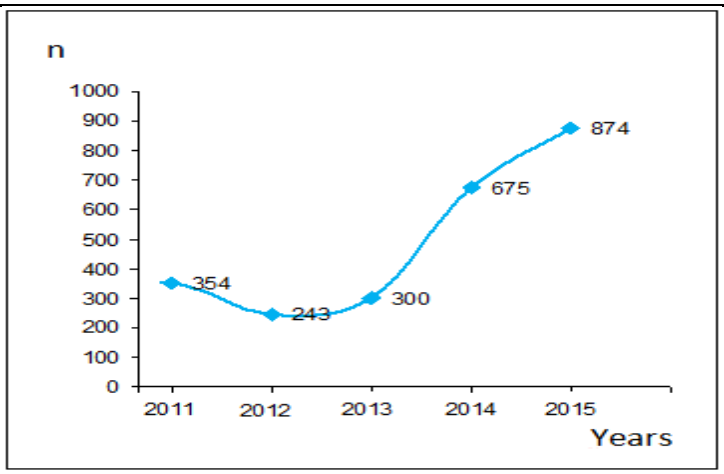

Figure 1. Distribution of marijuana use according to year

4. Discussion

The use of marijuana in Turkey has shown an increase just as it has generally worldwide. Especially, substance abuse among adolescents and young adults are a major health problem. According to the results of the current study, it can be said that cannabis use is widespread among males, and the majority were adolescents or young adults with a low level of education. Also, synthetic cannabinoid use was seen to be at least as widespread as marijuana use. In this study, it was determined that the drug which was most frequently was used marijuana.We found that cannabis use among males was higher and use of other drugs was common among the cannabis users. The risk of drug addiction can affect any individual in society, regardless of their education, occupation, or social support levels.

In other studies, Ögel et al evaluated among primary and secondary school children and reported the average age of cannabis use for the first time were 12.8±1.6 years among primary school students. This average was 12.7± 1.3 years for females and 12.9± 1.7 years for males. The average age of to cannabis use for the first time among secondary school students was 13.8± 1.9, 14.0± 1.8 years in females and 13.7± 1.9 years in males. Ögel et al found that cannabis use among males was higher and use of other drugs was common among the cannabis users (10). Yazıcı et al reported the mean age of drug users to be 32.12±10.21 years and 98.2 % were male. According to their data on distribution of particular drugs, marijuana was the most frequently used substance (90.8%) (11).

The results obtained in this study with the support of more extensive studies across the country (Turkey) in general can be considered helpful for the formation of strategies to combat the use of this substance.

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O-14 URINARY SCREENING TEST RESULTS AND CREATININE NORMALIZATION STANDARDS

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1. Introduction

Creatinine is a metabolic waste product that is formed from creatine and creatine phosphate in muscle and excreted by the kidneys (1).Commonly used creatinine detection methods are based on Jaffe reaction in urine specimen. Jaffe reaction is interfered by various interferents. Creatinine measurement can also be done by enzymatic method, acidification and buffered methods (2).

Creatinine measurement is important for screening, semi-quantitative screening analyses for clinical patients, probationers and workplace drug testing cases in forensic toxicological analysis. Urinary creatinine concentration serves as an indicator of urine dilution and it is recommened be analyzed with beside the drug parameters (3).

Forensic toxicological analyzes have shown that some of the tampering methods have been widely applied for false negativity. These methods can be grouped into three main basis categories. These are; in vitro adulterants, in vivo adulterants and dilution and substitution (4).

To avoid false negative results, different mathematical methods are used, including creatinine and drug screening test results. In this study, we aimed to choose the most appropriate method to prevent false negativity by examining the values obtained in these formulas according to the cut off values.

2. Methods

In this study, all cases that applied to our laboratory urine screening analysis results of were examined their reports between 2015- 2017. Urine samples creatinine values were considered to be diluted by European Workplace Drug Testing in Urine Guideline (5). In this guideline says for determination of the creatinine concentration;

- *If the creatinine concentration is less than or equal to 2.0 mmol/L (226 mg/l), the specific gravity must be determined. Acceptable values for specific gravity are 1.001 – 1.020.*
- *Samples with creatinine results within the range 0.5-2.0 mmol/L (56 -226 mg/l) and specific gravity results within range, should be reported as dilute. Because dilution of urine may cause false negative results, a comment should be added to negative drug testing results. Specimens which screen positive will be confirmed normally and reported if confirmed positive (at or over the pre-defined cut-off value).*
- *Specimens with creatinine results less than or equal to 0.5 mmol/L (56 mg/L) and/or specific gravity results out of range may be unsuitable for testing and should be reported as e.g. "specimen validity failed". Samples which screen positive will be confirmed normally and reported if confirmed positive (at or over the pre-defined cut-off value). Negative drug testing results should not be reported.*

Screening analysis for THC-COOH, amphetamine, ecstasy, opiate, benzodiazepine, cocaine and synthetic cannabinoids (JWH-018, JWH-073, AM-2201, UR-144) results were analysed beside the creatinine. False negativity rates were evaluated using linear models with different creatinine values for normalization. For the results of cases that need to be normalized according to creatinine value, the reference creatinine value was investigated.

$$\text{Concentration}_{\text{CR normalized}} = \text{Concentration}_{\text{specimen}} \times (\text{CR}_{\text{reference}}/\text{CR}_{\text{specimen}})$$

Figure 1. Equation for creatinine normalization (6)

3. Results

In this study, 18.792 cases urine screening results were investigated between 2015-2017. All cases creatinine values were found to correspond with normal distribution. ($p<0.05$, N=18.792)

All cases and out of extreme values creatinine levels were examined by year to year. Creatinine levels was found 133mg/dl for minimum and 153 mg/dl for maximum.

Table 1. Creatinine values of years

	Mean Creatinine Concentraion (mg/dl)	Median Creatinine Concentraion (mg/dl)	Std. Deviation
All cases (3 years)	145.68	138.00	83.82
2015	**153.00**	145.00	87.58
2016	150.95	143.00	85.61
2017	134.70	127.00	77.65
22.6-300 mg/dl (Out of extreme values in 3 years)	139.87	136.00	70.67
2015	144.10	141.00	72.24
2016	143.03	140.00	71.15
2017	**133.57**	128.00	68.53

When the creatinine values of male and female cases were examined, it was seen that the variance between the groups was significant. There is a significant difference between creatinine and gender.

Table 2. Creatinine values of gender

	N	Mean Creatinine Concentraion (mg/dl)	Std. Deviation
Man	17594	146.97	83.863
Women	1198	126.65	80.766

When the age values of the whole cases were examined, age values was found to fit the normal distribution. But no significant correlation was found between age and creatinine. ($r=-.082$, $p<0.01$, $N=18792$)

Age values of all cases were divided into groups of 10, there was a significant difference between age groups and creatinine mean values. ($p<0.05$)

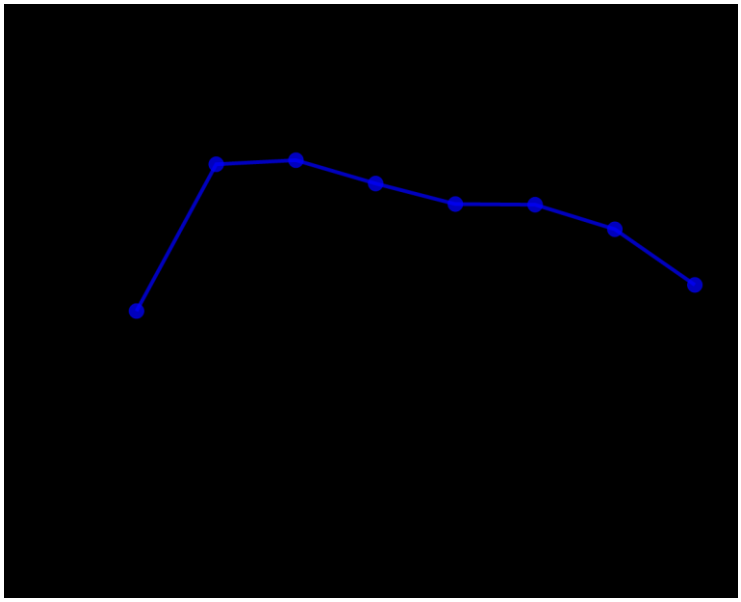

Figure 2. Age groups and creatinine mean values graph

Examining the sample collection times that are thought to create significant differences in individuals, there was a significant difference between urine samples collection time and creatinine mean values. ($p < 0.05$)

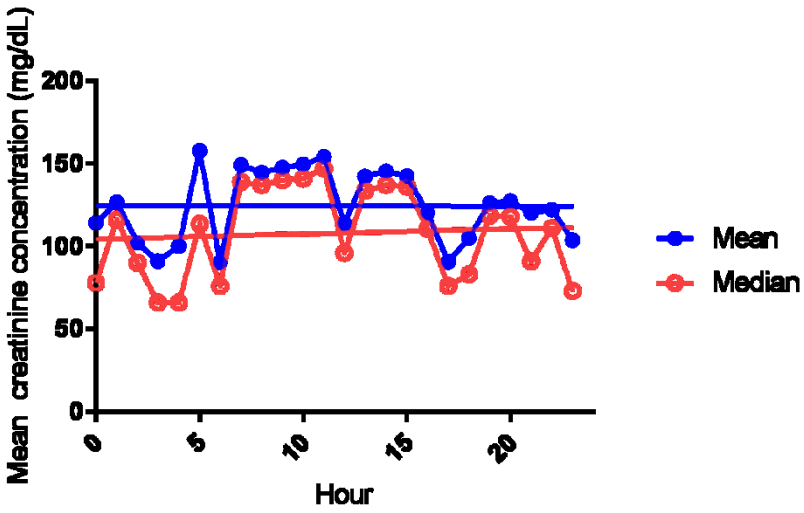

Figure 3. Sample collection time and mean creatinine concentration graph

553 cases urinary creatinine level was found between 5.6-22.6 mg/dL and was reported as diluted. After the normalization with different creatinine levels, false negative results changed to positives.

Table 3. Number of cases with normalization

	Year		Gender		Sample Collection Time	
	133 mg/dL	**153 mg/dL**	**126 mg/dL**	**146 mg/dL**	**90 mg/dL**	**157mg/dL**
THC-COOH	111	113	111	112	96	113
Amphetamine and derivatives	32	35	32	34	26	35
Opiate	4	5	4	3	3	5
Synthetic cannabinoids	5	5	5	5	5	5
Benzodiazepine	1	1	1	1	0	1

4. Discussion

One of the models used for normalization is a linear model. However, how should the average creatinine value that should be included in the formula be calculated, and what should the results be normalized to? The average creatinine values obtained vary from year to year, gender, age group or sample collection time and the rate of false negative/positive changes.

Although there is no current standard range of spot urine average creatinine value for Turkey currently. We should not disregard the effect of gender or sample collection time, perhaps physical characteristics such as age, weight and height for creatinine level which is very important for induvial toxicological reports. Also, approprate normalization models should be developed and inculeded in the guidelines.

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O-15 RELATIONSHIP BETWEEN NICOTINE DOSES AND FLAVOUR PREFERENCES IN E-CIGARETTE USERS

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INTRODUCTION

E-cigarettes are handheld battery-operated devices that aim to simulate conventional cigarettes. They deliver a solution typically containing nicotine, propylene glycol, glycerine and flavouring agents, which is heated and inhaled as an aerosol by users(1). Some E-cigarettes devices are without nicotine. There are over thousands of flavours in the market. Propylene glycol simulates the smoke and also glycerine in solution is for preventing irritation, so that people don't experience irritation during vaping.

The story of e-cigarettes is not really new. The first patent was taken in 1963. It took 40 years to produce an e-cigarettes for producers possibly because they didn't have enough battery technology and small heating module in order to produce the product, so they waited for a long time(2).

The situation in the world; there are increasing number of e-cigarettes users in everywhere such as Turkey and other countries. Also there is an increasing number of producers, mainly in China and there are many Chinese products in all over the world. There are increasing number of products and it is very big problem, because the products are always changing and there is no regulation about it.

The situation in Turkey; there is no product with a licence as most of the world. All products, which are obtained, are from internet and they are the result of illicit trade. In daily life, vaping indoor is prohibited as the same those e-cigarettes, so you cannot use e-cigarettes indoor in Turkey. WHO warns us about possible toxic compounds in e-cigarettes, also they warn about the possible toxicity as a result of heating process, because even the chemicals are known in the solution, if the product is heated very fast and to a very high temperature it can result formation of different chemical reactions. Also WHO warns us about the personal preferences and modification of devices, people buy "do it yourself kits" online and they modify their own devices; they increase the voltage and improve other coil and other parts for faster heating, so it is very hard to regulate the devices that people do it themselves(3-4).

There is a big question about e-cigarettes whether it is a cessation method or an addictive new product. There is a big debate on it in the world, for instance in United Kingdom National Health Service(NHS) is supporting e-cigarette use and they think that it is good for reducing percentage of people who are smoking conventional cigarettes but on the other hand there literature showing that it is a possible risk for young people who may think that it is nothing harmful(5-6).

We know that there are thousands of flavours in the market but there is no regulation about it. There is another important point that non-smoker young people may experience e-cigarettes without nicotine just for flavours but this can be a dangerous for using conventional cigarettes.

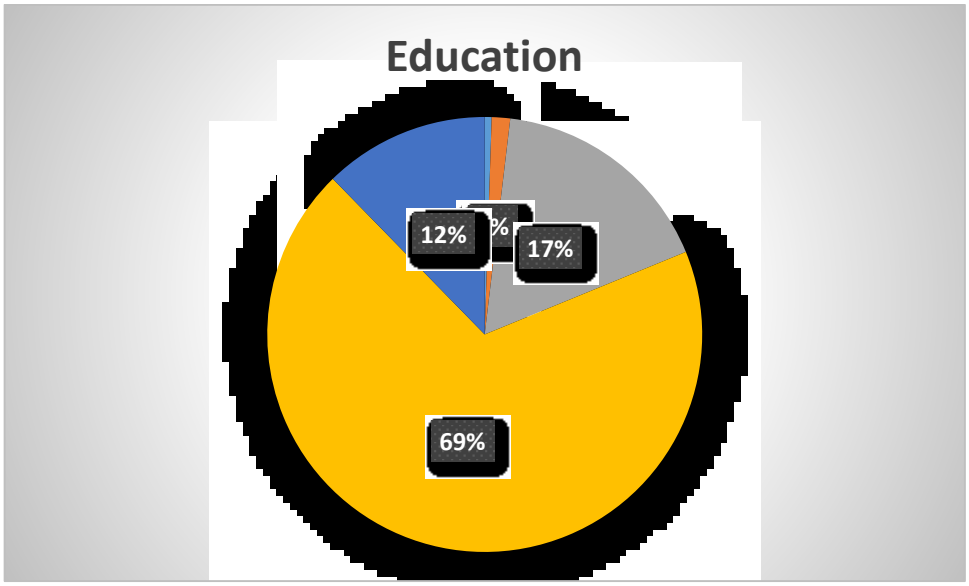
The aim of this study is to determine sociodemographic characteristics of Turkish e-cigarette users and investigate the relationship between nicotine doses of e-liquids they use and flavour preferences.

METHOD

Survey consists of 100 questions; 66 of them are about reasons of e-cigarette use with 5 likert type and 34 of them are about sociodemographical information and smoking status. 14 questions are open ended. Survey includes sociodemographic information, previous and current smoking patterns, reasons for e-cigarette use.

RESULTS

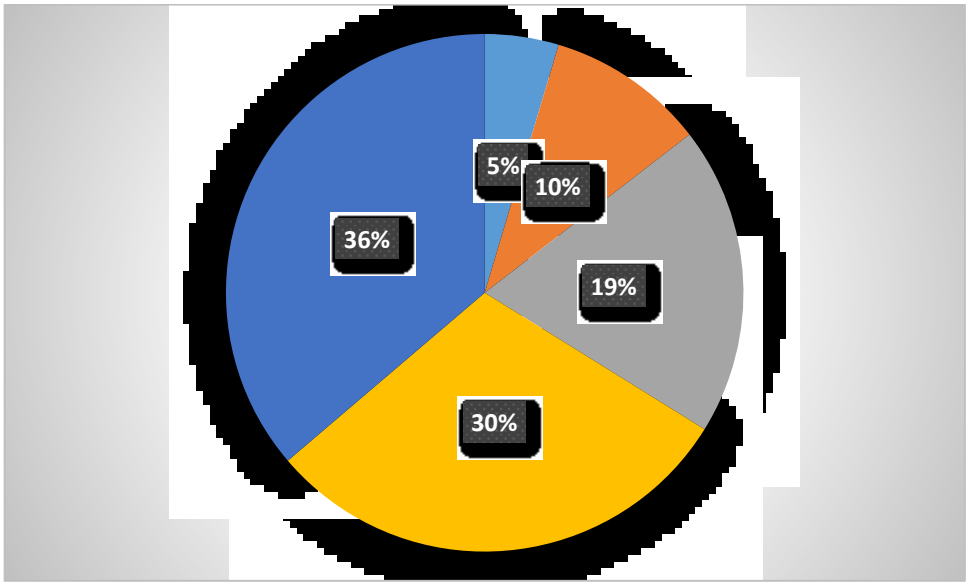
- A web based survey was conducted with participants (n= 585) who currently use e-cigarettes
- 97.8% (n=572) were men and 2.2% (n = 13) were women.
- Survey data includes socio-demographic information and vaping habits.



Graphic 1. Education of Sample

n=572

403 participants' education level (%69) is university; 99 participants (17%) have high school level; 72 participants (12%) have postgraduate level, 11 participants (1%) have secondary or primary education level.

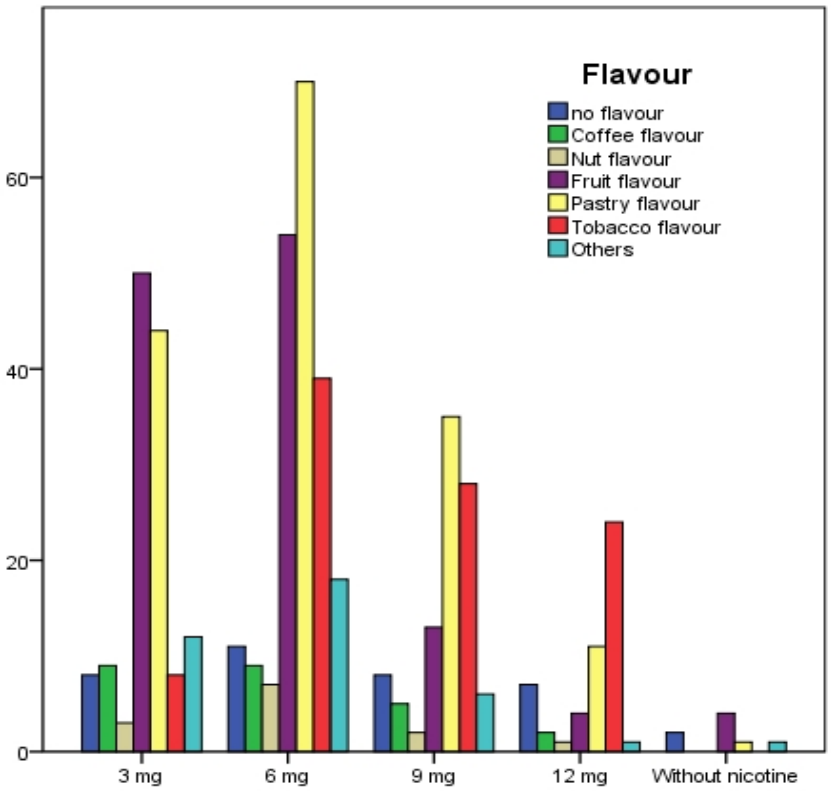


Graphic 2. Monthly Income of Sample

n=572

The monthly income of 212 participants of the sample (36%) is over 4500 TL; 175 participants (30%) are between 3500-4500 TL; 113 participants (19%) are between 2500-3500 TL; 58 participants (10%) are between 1500-2500 TL, 27 participants are (5%) are lower than 1500 TL.

Graphic 3. Flavour of Products That Sample use



Participants, who preferred 3 mg and 6 mg nicotine doses most preferred fruit and patisserie flavours. Participants who preferred 9 mg nicotine dose preferred the most commonly pastry and tobacco flavours. Users who preferred 12 mg dose nicotine mostly preferred tobacco flavour.

Multiple Comparisons

flavour_group	flavour_group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
fruit	no flavour	-1,09478*	,35849	,038	-2,1555	-,0341
	coffee	-,52850	,42755	,880	-1,7935	,7365
	nuts	-,33752	,60887	,998	-2,1390	1,4640
	patisserie	-,41119	,23140	,564	-1,0959	,2735
	tobacco	-1,64978*	,26008	,000	-2,4193	-,8802
	other	,08905	,36160	1,000	-,9808	1,1589
patisserie	no flavour	-,68360	,34903	,442	-1,7163	,3491
	coffee	-,11731	,41965	1,000	-1,3590	1,1243
	nuts	,07367	,60334	1,000	-1,7115	1,8588
	fruit	,41119	,23140	,564	-,2735	1,0959
	tobacco	-1,23859*	,24688	,000	-1,9691	-,5081
	other	,50024	,35222	,791	-,5419	1,5424
tobacco	no flavour	,55499	,36867	,742	-,5358	1,6458
	coffee	1,12127	,43612	,137	-,1691	2,4117
	nuts	1,31226	,61491	,334	-,5071	3,1316
	fruit	1,64978*	,26008	,000	,8802	2,4193
	patisserie	1,23859*	,24688	,000	,5081	1,9691
	other	1,73883*	,37169	,000	,6391	2,8386

Table 1. Multiple Comparisons of Flavour Groups

Participants who prefer fruit flavour differ significantly in terms of nicotine dose from users who prefer tobacco flavour and non- flavour. Users who prefer patisserie flavour differ significantly in terms of their nicotine dose preferences with users who prefer tobacco flavour. Also participants who prefer tobacco flavour differ significantly in terms of their nicotine dose preferences with users who prefer fruit and patisserie flavour.

CONCLUSION

Our results show that higher nicotine dose preferring individuals are mostly preferring tobacco flavour. On the other hand there is another group of users who prefer fruit and pastry flavours with relatively lower doses of nicotine. Although e-cigarettes are marketed as an alternative smoking cessation method, many users are using these products as a new addictive substance. These result may indicate that users percieve e-cigarettes differently. It is both a substitute for conventional cigarettes/cessation method and also a novel addictive product. User preferences should be further investigated in order to develop more effective preventive methods against e-cigarette use.

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O-18 RELATIONSHIP BETWEEN NICOTINE ADDICTION SCORES AND SMOKING DURATION OF PATIENTS WHO APPLIED TO SMOKING CESSATION CLINIC

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INTRODUCTION

Smoking is the most common form of tobacco use worldwide and is one of the most common causes of death in the world. The World Health Organization (WHO) defines smoking as "the world's fastest-spreading and longest-running epidemic"(1). It is also very important for Turkey to fight against smoking which is responsible for preventable diseases and deaths.

Tobacco control efforts in started in 1996. After the signification of the World Health Organization Tobacco Control Framework Convention (FCTC) by Turkey government in 2004, tobacco control activities have been accelerated. The Law to protect individuals and future generations from harms of tobacco and tobacco products and to ensure clean breathing was accepted in 2008 and eventually it banned smoking in all public indoor places. In 2009 smokefree air zone implementation has been started in the hospitality sector (2).

All these political approaches for reduce smoking are supported with smoking cessation clinics in almost all provinces in Turkey. According to WHO Report On The Global Tobacco Epidemic 2017 (3), Turkey is among countries with the highest level of achievement in Tobacco Dependence Treatment.

According to Global Adult Tobacco Research 2012 Report, about half (46.0%) of smokers had tried to quit smoking within 12 months of the study. In this case, it is useful to apply to a smoking cessation treatment unit for professional help in the smoking cessation process. Participation in a professionally prepared program will enable evaluation with both physical and psychological history and it will provide the selection of the most appropriate approach and treatment. In order to avoid cigarette use, also it is important to investigate the relationship between nicotine addiction and users' characteristics well. The aim of this study is to establish the relationship between the socio-demographic characteristics of the patients who applied to the smoking cessation clinic and the duration of smoking and the nicotine addiction scores.

METHOD

This retrospective study was performed on 377 smokers admitted between January 2018 and June 2018 to Ege University Institute on Drug Abuse, Toxicology and Pharmaceutical Science Smoking Cessation Clinic.

Socio-demographic characteristics, psychological / physical health status and smoking habits of patients who applied to clinic were obtained.

Patients were divided into 3 groups according to their total duration of smoking. Total duration of smoking means, they have been smoking how many years, except for quitting periods. The first group consisted of people who smoked for 1-15 years, Group 2 smoked for 16-29 years, Group 3 people were smokers for 30 years and over. Patients with ongoing psychiatric disorders and treatment were not included in the study.

For statistical analysis, SPSS V24 program was used.

RESULTS

It was found that groups formed according to addiction level and duration of smoking had a significant difference when compared with one-factor analysis of variance (p=,002).

There were 239 (63.5%) were male patients and 138 (36.5%) were female patients. The minimum age was 18, the maximum age was 76, and the mean age was 39.4 ± 12.1 years.

56.9 percent of the patients began smoking before the age of 18 years. The most frequent admission was in the 23–49 age group.

Addiction scores of participants did not differ significantly according to age to start smoking (p=0,541). Also addiction scores of participants did not differ significantly according gender or marital status (p= 0,979 - p=0,332).

DISCUSSION

The results show that smoking addiction scores are lower in the first years of cigarette smoking and the addiction is strengthened as the number of smoking years increases. As the number of smoking years increases, the psychological aspect of the addiction increases as well as the physiological aspect of addiction. Day by day, the number of emotions and events matched with cigarettes will increase, and it will become more difficult to quit smoking.

There are conflict results about how people affect from past smoking cessation experiences. Some studies indicate that the previous negative experience has a negative impact on the new smoking cessation attempt. Some studies indicate the opposite which is an unsuccessful smoking cessation experience may increase the chances of quitting in future trials as well (4). In this case, quitting smoking can be a learned process so smokers should be encouraged to attempt smoking cessation.

Smoking-related health problems and the difficulties in quitting should remind us how important the protective precautions are. Smoking cessation clinics should be improved in terms of intervention during early smoking periods. This result indicates that new approaches are needed in order to help smokers for earlier quit attempts for better quit rates.

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O-19 DETERMINATION OF DIFFICULTIES IN THE REHABILITATION PRACTICES ON DRUG USER PROBATIONERS AND PROBATION OFFICERS-EXAMPLE OF IZMIR CITY

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INTRODUCTION

Probation is a punishment and enforcement system in which alternative measures and sanctions are imposed on convicts by courts. Probation measures contain rehabilitation, correction and reintegration programmes in addition to enforcement of penalties(1). Probation staff(probation experts/officers) can have difficulties in areas such as: job stress, job satisfaction, personal accomplishment, communication skills with drug user probationers, collaboration with other associations due to intensive demand by drug users in big cities and some law regulations for offenders in probation system.

Burnout is a psychological syndrome emerging as a prolonged response to chronic interpersonal stressors on the job. There are three key dimensions of this response: an overwhelming exhaustion, feelings of cynicism and detachment from the job, and a sense of ineffectiveness and lack of accomplishment. The individual stress experience within a social context and the person's conception of both self and others are significant in these dimensions(2).

According to White et al; the high demands and responsibilities of probation work can lead to burnout(3). Burnout is a common psychological syndrome in "helping" professions such as probation staff and it is a result of long-term stress which includes emotional burnout, depersonalization and personal accomplishment reduction. It can affect less performance of probation staff in rehabilitation programmes, thus it is needed to develop new adaptive approaches and training models with support of academician studies in Turkey.

According to the statistics of data of Ministry of Justice in Turkey in September of 2018,currently the number of offenders who are under supervision of probation system in Turkey is 614.901 and 63.063 of them have been obeyed to probation sentence because of having or using substance(4). If the probationers have re-used substance and arrested or don't obey to responsibilities which probation sentence requires in 5 years(after the first process of probation sentence begins), they can be judged with imprisonment by courts for 2-5 years. After

being released from prisons if the conditions are suitable(such as offender doesn't have any disciplinary penalty and other law regulations), probation process starts for offenders(parolees) and they have to have rehabilitation programmes, for instance; group workings which aims preventing re-using or reducing problems about cigarettes, alcohol and drug addiction. The parole process presupposes more obligations than having the first probation process for an offender(parolee) such as signing at police stations regularly, obeying to interviews with probation experts(psychologist, social workers, sociologists and teachers), joining in group workings which probation experts carry out, have to have a legal job for not to do community payback/service etc during his/her probation sentence. They can have problems or not enough motivation about finding a legal job or keeping working regularly and sometimes they can have discriminative problems by employers and also have difficulties about having permission from their employers to attend to the rehabilitation programmes in workdays under probation service. They need to be supported by vocation courses and employment opportunities and they need to be motivated to increase their awareness at community rules in public life. Also parolees can have comorbid problems in addition to drug abusing such as anger management, doing other crimes(robbery, selling drugs, actual bodily harm etc.) and probation officers need to have intensive collaboration to provide these needs of offenders to prevent re-offending or re-using drugs in their rest of lifes.

There are structured group workings for juveniles and adult offenders and the programmes have been using in probation directorates extensively in Turkey. The parolees can have criminal background and drug using problems at the same time. On the other hand the rehabilitation programmes for drug user probationers should be varied due to their variable characteristics and needs such as: age periods, education background, level of substance use disorder, comorbidity in psychiatric disorders etc. not only with group workings but also special programmes with job centers, art workshops residentially in probation directorates or other institutions which are located to probation directorates closely.

The purpose of this study is to determine the difficulties experienced by probation staff and probationers with substance use disorder(SUD) during rehabilitation in probation service at the same time, thus; to recommend to make the program better functioning.

Hypothesises of the study are:

-The job satisfaction of probation staff decreases as the job stress increases.

-The level of emotional burnout and depersonalization of probation staff increases and individual success decreases which are several sub-dimensions of burnout as job stress increases.

-The perceived level of probationers' satisfaction about probation service decreases as severity of probationers' substance use disorder increases.

METHODS

"Survey of Evaluating Probation Service for Probationers", "Addiction Profile Index(API)" ,"Multidimensional Scale of Perceived Social Support", "Personal Information Form" will be applied to 200 adult drug user probationers as self-report. The drug user probationers will be selected from who obeyed due to article:191 or other offenders who have substance use disorder. "Job Stress Scale", "Minnesota Job Satisfaction Scale", "Maslach Burnout Inventory(MBI)", "Inventory of Communication Skills", "Survey of Evaluating Drug User Probationers for Probation Staff" will be applied to 70 probation experts and correction officers as self-report. For statistical analysis, SPSS V24 program will be used.

CONCLUSION

It is aimed that evaluating drug user probationers' features of using drug and related to probation(perceived self-development, satisfaction of probation service) will contribute to determine needs for rehabilitation models in probation services, consequently it can contribute to improve current rehabilitation models or/and develop innovative methodologies, researches in relevant studies in the future and also evaluating probation staff's levels of job satisfaction, emotional burnout, depersonalization, perceived individual job success and communication skills will contribute to understand how to structure new models of trainings for professions in probation staff in the future. There will be 2 different kinds of sample of drug users; the probationers who was obeyed due to article:191 or other offenders who have substance use disorder and the sample of other offenders with substance use disorder is less researched before, so it is important to have results of features of offenders with other crimes and addiction problems at the same time. Also it is critical to understand high level addicted people can reach to less opportunities due to probation services need more resources for them by evaluating that whether there is correlation between whether the results of satisfaction of probation service and the level of drug addiction.

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O-22 DETERMINATION OF BREATH ALCOHOL CONCENTRATION AFTER USING MOUTHWASH PRODUCTS

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INTRODUCTION

Alcohol is a chemical that is frequently encountered in moisturizers, cleansers or tonics. Due to the physicochemical properties of alcohol, the products formulated using alcohol are preferred as raw materials by the producers because they are lightweight, easy to release and the feeling they leave on the skin is refreshing. Mouthwashes are used frequently to improve personal oral care or suggested by dentists for mouth health. In order to improve antibacterial activity, some mouthwashes contain ethanol and it has recently been a problem for drivers [1]. A variety of mouthwashes and soft drinks were tested and found to contain low concentrations of alcohol [2]. It is well known that alcohol is retained in the mouth for a short period following consumption of alcoholic beverages or following use of alcohol-containing breath sprays or mouth washes [3].

The aim of this study was to evaluate the concentration of breath alcohol by alcoholmeter after use of personal care products containing alcohol.

METHODS

The study involved 10 healthy volunteers: 7 females and 3 males with their mean age 27.6 and age range is between 20.0-40.0 at Ege University, Institute on Drug Abuse, Toxicology and Pharmaceutical Science. The volunteer properties; no alcohol and non-psychoactive substance use, normal body mass index (18.5- 24.5), there is no health problem, no chronic and metabolic disease (Diabetes etc), no drug use. The volunteers couldn't smoking for 6 hours prior the test and not drink alcohol or eat for 3 hours prior to the test. Two different mouthwashes, a mouth spray and ethanol/water mixture (10/90 v/v) reference were used in the study. Breath alcohol measurements were taken from each volunteer before using these products. Alcohol concentrations in the breaths of the volunteers were measured using the breathing-alcohol analyzer (Lifeloc FC20 Alcoholmeter) after using these products at certain intervals. Figure 1 shows that the alcoholmeter which is used in this study.

Figure1: Lifeloc FC20 alcoholmeter

RESULTS

In our country, commercial vehicle drivers and public service drivers are completely banned from the traffic with alcohol. For other drivers, 0.50 Promile has been determined as a legal limit, equal to half a gram of alcohol in one liter of blood. The ethanol concentration results that found volunteer breath according the two different mouthwash products are listed in table 1 According to this results obtained in 5 minutes following the use of personal care products, which are frequently used as amouthwash products in daily life, were found to be above the 0.5 promil limit according to Article 97 of Road Traffic Regulation No. 2918.

			A mouthwashes (promil)				B mouthwashes (promil)			
NUMBER	SEX	PASSİVE ALCOHOL TEST	1.min	5.min	10.min	15.min	1.min	5.min	10.min	15.min
1	FEMALE	NEGATIVE	External	1,1	0,34	0	1,05	0,21	0	0
2	FEMALE	NEGATIVE	External	1,31	0,33	0	1,3	0,21	0	0
3	FEMALE	NEGATIVE	External	1,28	0,17	0	1,27	0,19	0	0
4	FEMALE	NEGATIVE	6	2,14	0,17	0	1,05	0	0	0
5	FEMALE	NEGATIVE	External	0,74	0,12	0	1,17	0,019	0	0
6	FEMALE	NEGATIVE	6	0,28	0	0	1,15	0	0	0
7	FEMALE	NEGATIVE	External	0,58	0,17	0	0,85	0,1	0	0
8	MALE	NEGATIVE	External	2	0,35	0,1	1,7	0,26	0	0
9	MALE	NEGATIVE	6	0,8	0,19	0	1,05	0,11	0	0
10	MALE	NEGATIVE	External	2,332	0,55	0,17	1,12	0,19	0	0

Table 1: 10 volunteers results for mouthwash A and B

After the use of mouth spray. the results were found to be above the legal limit in the first minutes. The results for the ethanol concentrations found in the different mouthwash are listed in Table 2.

	Mouth spray (promil)	
Time	**1 ML**	**2ML**
0.min	2,97	3,67
1.min	0,75	0,67
2.min	0,39	0,32
3.min	0,34	0,15
4.min	0,25	0
5.min	0,19	0

Table 2: Use of 1mL and 2 mL mouth spray values.

We analysed ethanol:water/10:90 mixture concentration in one volunteer breath as a referans solution to see the 10% of ethanol results in breath.

	10% Ethanol:Water
Time	**Volue (promil)**
1.min	0,9
5.min	0,14
10.min	0

Table 3: Referance ethanol concentration resuts for one volunteer.

CONCLUSION

After the use of personal care products in this preliminary study, alcohol concentrations were obtained according to the results of the tests performed in the breath, close to the legal limit accepted in our country. This suggests that the alcohol detected in the patient's breath was determined by oral alcohol intake. If people claim that they do not drink alcohol, a measurement is required after waiting for a certain period of time. In this way, both the innocence of the person emerged and the legal criminal procedures to avoid dealing with. It is the determination of alcohol in the blood in terms of accuracy and reliability.

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O-27 COMPARISON OF FACTORS AFFECTING THE DEVELOPMENT OF LATENT FINGERPRINTS IN CRIME SCENES IN TERMS OF SURFACE TYPES

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INTRODUCTION

Accurate and fast investigation of crime scene in crime events is effective in solving judicial events. (2). One of the important aims of the crime scene investigation is to conduct fingerprint research to determine the perpetrator. The importance of the fingerprint is that the fingerprints that the person leaves when touched the surface and their properties can be detected even if they are small. (3). Presence of a fingerprint suitable for identification from materials at the crime scene; it is very important to understand the crime and find the criminals. (1).

Surface heat, surface structure, fingerprint of the surface of the fingerprint secretions play a role in the transfer. (3,5). It is also known that secretor quantities occur in very different variations at different times from man to person or in the same person (6). After the fingerprint is released to the surface, a deterioration process starts, which causes the loss of sharpness of the finger due to various factors. (4). For this reason, it is not possible to obtain fingerprints suitable for identification from every material left by the perpetrator.

In this context, the aim of this study is to determine the effects of time, temperature, humidity, water, age, sex, contact and contamination to the fingerprints at the findings belong to different surface types obtained from crime scene investigation. It is also to determine which types of surfaces are suitable for fingerprint development and whether fingerprints can be improved in laboratory environments.

MATERIALS AND METHODS

In the study, fingerprint samples of four women between the ages of 24 and 50 who signed the consent form were used. The research period of this study, using the modeling method, was carried out over a period of twelve months.

Preparation of Samples:

Samples of fingerprints were obtained from cases that were frequently encountered at the crime scene and easily obtained in daily life. Microscope slide for glass, white A4 paper for paper, slat for raw wood, galvanized sheet for metal, transparent plastic bag for nylon and various

surfaces for mica were used and left fingerprinted. To prevent contamination of fingerprint samples, information about the volunteer was written on the label.

Fingerprints taken from the volunteers were provided on the surface of different surface types and provided fingerprint development by making seven trials in different periods up to 1 month, 1 week, 1 month, 3 months, 6 months, 9 months and 12 months in both air and water environment. In the study, the Marmara Sea for salt water; We tried to provide environments that could be encountered at the scene by using Küçükçekmece Lake for fresh water. In the trials, 504 samples were used in 4 volunteer individual fingerprints on 6 different surfaces, 3 separate conditions (Freshwater - Saltwater and Air environment) and 7 at different time intervals. Thus, it was determined in which environment conditions at which the fingerprints would be suitable for identification.

Relation Between Fingerprint and Temperature:

The fingerprint samples were exposed to heat at 50 ºC, 100 ºC, 150 ºC, 200 ºC, 250 ºC, 300 ºC (exposed for three minutes for each degree). In addition, five trials were conducted on a quarterly basis (0^{th} month, 3^{rd} month, 6^{th} month, 9^{th} month and 12^{th} mohth). In the experiments, a total of 720 samples were used in 5 different time zones, 6 volunteer individual fingerprints on 6 different surfaces and 6 different temperature ranges.

Fingerprint and Moisture Relationship:

The fingerprint samples were exposed in 30%, 60% and 90% humid environments. Three tests were performed in 3 different time zones (1 hour, 2 hours and 3 hours) and six months (0^{th} months, 6^{th} months, and 12^{th} months). In the trials, fingerprints of 4 volunteers were used on 6 different surfaces and 3 different humidity levels. In addition, 648 samples were used in 3 different time zones and 3 different time intervals.

Fingerprint and Pressure Relation:

At the samples of fingerprints; 400 grams, 600 grams and 800 grams of weights were used to increase the amount of force acting on the unit area and three trials were performed at sixth month (0^{th} months, 6^{th} months, 12^{th} months). In the trials, 4 volunteer individual fingerprints were applied on 6 different surfaces. In the trials, 4 volunteer individuals left their fingerprints on 6 different surfaces. Three different force values applied perpendicular to the surface were applied. In addition, 216 samples are used in 3 different time intervals.

The Relationship Between Fingerprint and Contamination:

In order to investigate the contamination effect, 5 items (gasoline, diesel oil, oil, paint and blood) frequently encountered in daily life were brought into contact with 6 different surfaces and 4 volunteer individuals were allowed to place their fingerprints. In addition, a total of 360 samples were used in six-months periods (0^{th} months, 6^{th} months, and 12^{th} months).

RESULTS

The results of the fingerprint samples were classified according to at least 13 fingerprint characteristics and whether they could be classified or not. The results were obtained based on the identification system used in Turkey. 77 fingerprints which is suitable for identification were obtained from fresh water samples. 60 fingerprints which is suitable for identification were obtained from the samples extracted from the salt water environment. The number of fingerprints suitable for identification in the aquatic environment were 18 for glass, 20 for metal, 15 for plastic, 12 for nylon, 8 for paper and 4 for wooden surfaces. The most suitable surfaces for fingerprint development are glass and metal surfaces. The number of fingerprints according to identification was determined as 146 in fresh air, 77 in fresh water environment and 60 in salt water environment. Fingerprints up to 90 days were classified in fresh water. In salty environment, fingerprint development which is suitable for identification up to 70 days has been determined. This rate is up to 12 days for the weather.

The number of fingerprints for the identification of females and males who participated in the study during the study period was determined as 79 in males and 67 in females. When the number of fingerprints suitable for identification, young and old individuals who participated in the tests were compared, 82 fingerprints at young individuals (24-30 years old), 64 fingerprints at older individuals (45-50 years old) were found.

In the study, it was determined that the number of fingerprints suitable for identification decreased as the temperature increased. However, fingerprints suitable for identification up to 300 ° C were obtained. During the study period, all temperature values were found 118 pieces on glass surfaces, 112 pieces on metal surfaces, 62 pieces on plastic surfaces, 52 pieces on nylon surfaces, 102 pieces on paper surfaces and 86 fingerprints on wooden surfaces. In the study, it was determined that there were 199 pieces at 60% humidity rate, 210 pieces at 80 % humidity and 204 fingerprints at 100 % humidity rate. The ideal moisture content for fingerprint development was found 80 %.

When the fingerprints were transferred to the surface, the force applied to the unit surface was applied as 400 g, 600 g and 800 g. The number of fingerprints obtained is 65 pieces,

40 pieces and 15 pieces respectively. Effects to number of fingerprints which is suitable for identification of substances contaminated on surfaces was found 82 pieces in 0^{th} month, 71 pieces 6^{th} month, 52 pieces in 12^{th} month.

DISCUSSION

The characteristics and structure of the fingerprinted surface are the most important factor in the selection of the fingerprint development methods appropriate to the surface as well as the persistence of the fingerprint on the surface. The surfaces required for the fingerprints used in the study are selected from glass, metal, plastic, nylon, paper and wood surfaces which are frequently used in daily life. When fingerprints were transferred to the surface, a significant decrease was detected in the number of fingerprints that were suitable for identification as the force applied to the unit surface increased. The main reason for this situation is that the secretions from the pore holes that make up the fingerprint are transferred to the surface within maximum 10 seconds and the unintentional increase in the pressure force as the time progresses causes the natural appearance of the fingerprint to deteriorate. Waiting for 10 seconds during the transition between the surfaces ensures that the amount of secretion from the pore holes is distributed evenly to each surface. In the studies, it was proved that the amount of epithelial cells left by the first contact and the secretions from the porous holes did not have an increasing effect on the amount of secretion and cell in contact times over 10 seconds (10).

It has been observed that fingerprints on glass, metal, plastic and nylon surfaces in water environment are more suitable for identification than fingerprints on paper and wooden surfaces. In addition, it was determined that the most suitable surfaces for fingerprint development were glass and metal surfaces. It has been determined that fingerprints left in the air in terms of surface types are relatively more classifiable than those in fresh and salt water environments. Therefore, fingerprints suitable for more identification than fingerprints kept in air were detected. The most important factors affecting the availability of fingerprints on surfaces were the time of submergence of the surfaces, the type of surface, the type of water and the content of the environment. In all environmental conditions, fingerprints that are appropriate for identification have been observed to decrease over the 12-month working period.

It was determined that the fingerprints taken from men were more appropriate to identification in the comparison of the number of fingerprints in accordance with the identification of the women and men participating in the experiments during the study period.

Because the amount of fluid released by women per unit time is less for men, they leave less fingerprint fluid on the surface they come in contact with. This leads to a lower quality of the latent fingerprint developed (11).

When the number of fingerprints suitable for identification was compared in young and old individuals participating in the experiments during the study period, it was found that the number of fingerprints suitable for diagnosis in young individuals (aged 24-30 years) was very high compared to the elderly individuals (45-50 years). The epidermis layer in the skin of older people is thinner than that of young people. Therefore, the papil lines in this layer are flattened and have lost their elasticity. There are also more wrinkles in the papillae. (11).

Considering the temperature values, the number of fingerprints suitable for identification decreases when the temperature increases. But fingerprints which is suitable for identification up to 300ºC were obtained. As the increase in temperature adversely affects fingerprint development, the organic components in the fingerprint liquid disappear at a temperature above 200ºC. Only inorganic molecules were found in the fingerprint component. (12). In the study, it was determined that fingerprints left on glass surfaces at all temperature values were more suitable for identification than metal, plastic, nylon, paper and wooden surfaces. According to studies that reported better results on the glass, the porous structure of the surface increases the rate of sweating. This causes both papillary lines to become prominent and causes more epithelial cells to be left on the surface (13).

In this study, when the waiting time on fingerprints surfaces (fingerprint age) increases, the amount of moisture used to make the fingerprint visible has been increased.

Since the initiating component of the cyanoacrylate polymerization is water-soluble components, the initiator components are not effective when the water in the environment is removed. Keeping fingerprints in high humidity environments partially tolerates the water vapor that evaporates through the fingerprint fluid. however, it cannot completely bring the fingerprint to its original rate at the time of release. (7,8,14).

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O-28 DETERMINATION OF THE MAIN TOXINS OF MAJOR POISONED MUSHROOMS WITH SINGLE METHOD OF LC-MS/MS

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INTRODUCTION

Mushroom poisoning can be seen worldwide and also in our country. Because of its devastating results it constitutes problems. In our country, consumption of wild-type mushrooms is common. Wild mushrooms are picked up and consumed commonly from the forests because of its good taste and nutritional value. Poisoned mushrooms can grow among the mushrooms without poison and also they can look like them. When unexperienced, uneducated persons collect mushrooms, cases with poisoning can be seen. In the year 2013, individuals who poisoned by mushrooms were 1706; ın the year 2014, these numbers increased to 5228. These numbers are increasing by the years.(1) Even very small amounts can be fatal within the mushroom poisoning, so early detection and treatment is very important. (2) Why it is important to detect main mushroom toxins with one method? Early treatment is important in mushroom poisoning. Existence of poisoning and determining the type of toxins with single method increases chance of early treatment. LC-MS/MS device determines the toxins as soon as they enter the blood circulation in even very small amounts. There is still no methods worldwide which can determine all mushroom toxins in one method and with single device. In this study, we aimed to develop Liquid Chromatography-Mass Spectrometer (LC-MS/MS) method which can rapidly determine the main mushroom toxins with single method.

METHOD

The main 12 mushroom toxins, which cause most of the mushroom poisoning cases, were extracted and used. (Amatoxins, phallotoxins, coprine, gyromitrin, ibotenic acid, muscarine iodide, orellanine and muscimol toxins) Amatoxins and phallotoxins were collected and extracted from the natural environment of Amanita phalloides type fungi, which contained the most fatal mushroom toxins. Coprine, gyromitrin, ibotenic acid, muscarine iodide, orellanine and muscimol toxins standarts provided. (Coompo Research Chemicals) 30% methanol (LC grade, Merck) and 70% ultrapure water were used for the extraction of Amanita Phalloides type mushrooms. Extract centrifuged and prepared for the device by filtered 0.22 mm filters.

LC-MS/MS (Shimadzu Corp.) was used for the analysis of mushroom toxins. Optimum conditions prepared to achieve separation in the LC fraction; with the C18 column (250x2,1 mm, 2,6 µm) and in the mobile phase, 50 mM ammonium acetate (solvent A) and 0.1% formic acid containing acetonitrile 90:10 (A/B). After the system is stabilized at a flow rate of 1,2 ml/min and the column oven is set at 40 °C and the method takes 30 minutes in total with different gradients applied.

All mushroom toxins (Amatoxins, phallotoxins, coprine, gyromitrin, ibotenic acid, muscarine iodide, orellanine and muscimol toxins) were determined by using SIM mode (single ion monitoring) in LC-MS/MS system in the same conditions. In the SIM mode; mass absorber tracks only few mass/charge ratios. The SIM mode is more sensitive than scanning mode, but provides information about fewer ions. In summary, if the molecular weight of the wanted substance is known SIM mode is a better choice as given in Table 1.

Table 1. Toxin names, mass to charge and retention times

Toxin Name	**Mass to charge (m/z)**	**Retention Time (min)**
IBOTENIC ACID	175	2,3
COPRINE	202	2,53
MUSCARINE IODIDE	301,17	8,6
BETA AMANITINE	919,96	12,6
ALPHA AMANITINE	918,97	13
GAMMA AMANITINE	902,97	15,1
ORELLANINE	252,15	17,07
PHALLISIN	804,87	17,2

PHALLACIDINE	846,90	17,6
PHALLOIDIN	788,87	18,3
MUSCIMOL	114	20,6
GYROMITRIN	100,12	-

RESULTS

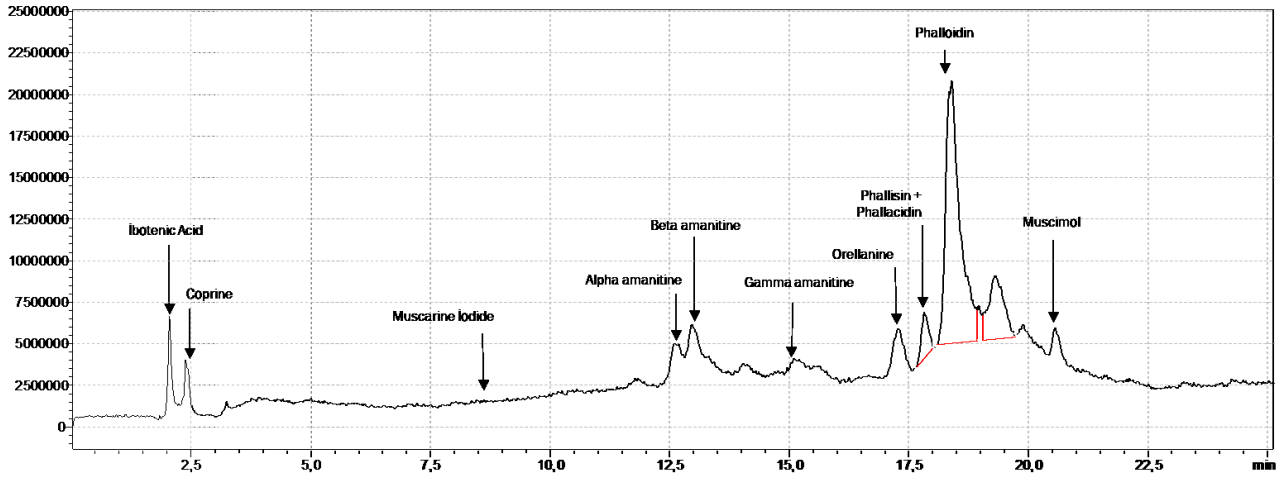
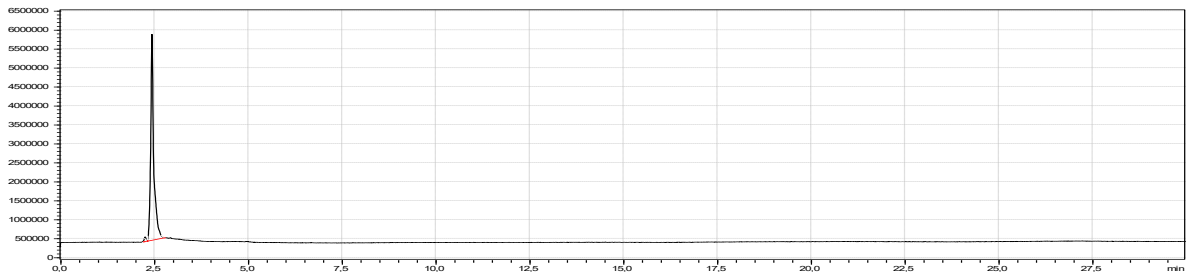


Figure 1: All mushroom toxins in our study in one spectrum



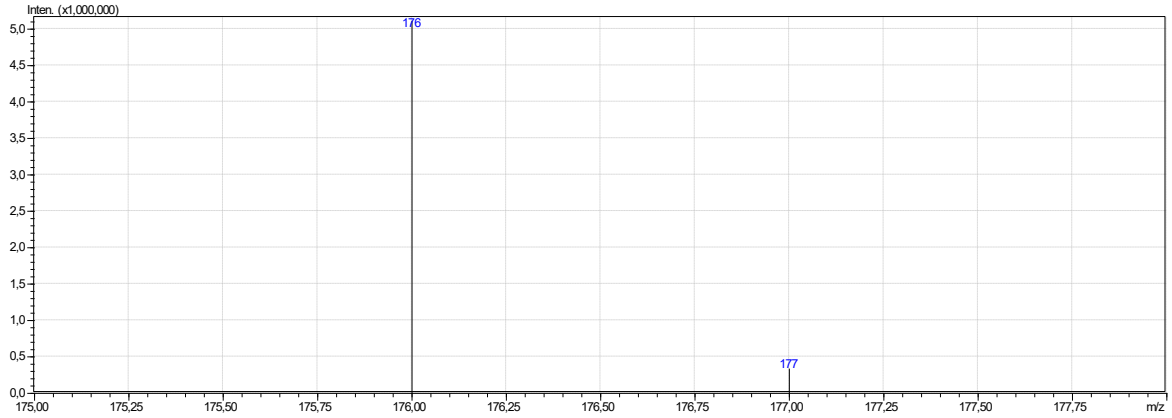


Figure 2: Spectrum (upper) and SIM (below) appearance of ibotenic acid

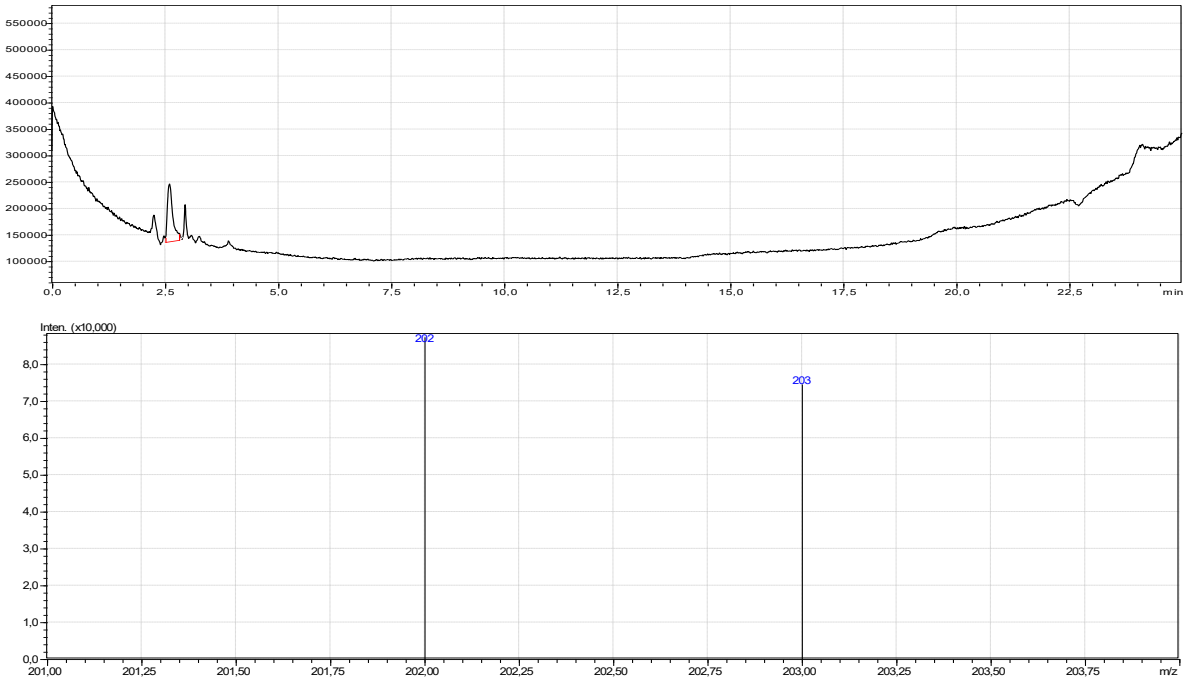
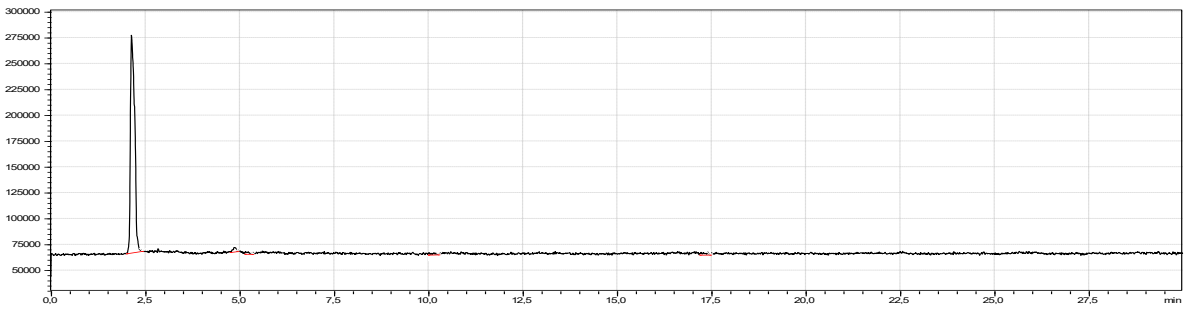


Figure 3: Spectrum (upper) and SIM (below) appearance of coprine



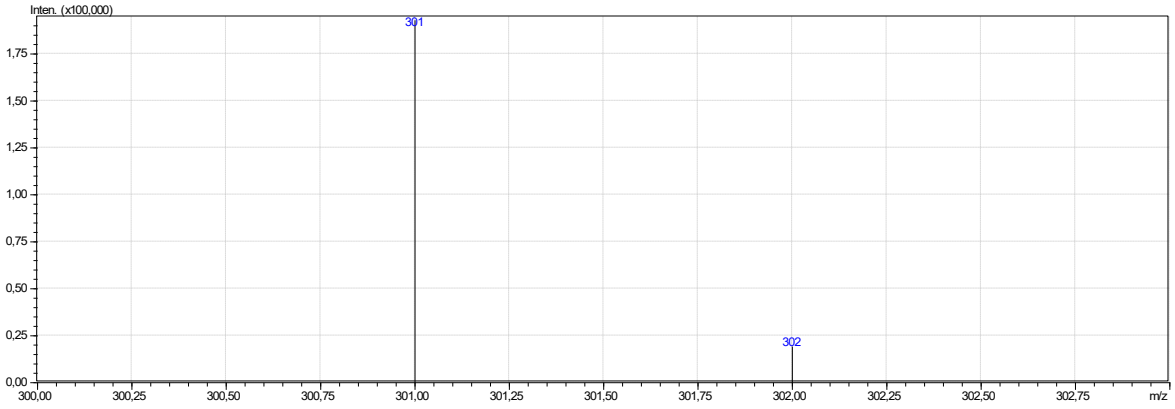


Figure 4: Spectrum (upper) and SIM (below) appearance of muscarine iodide

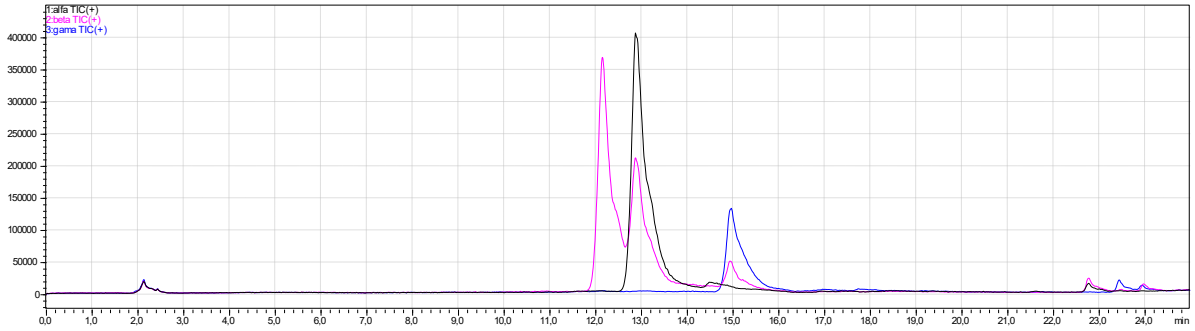


Figure 5: Appearance of amatoxins in our study in one spectrum

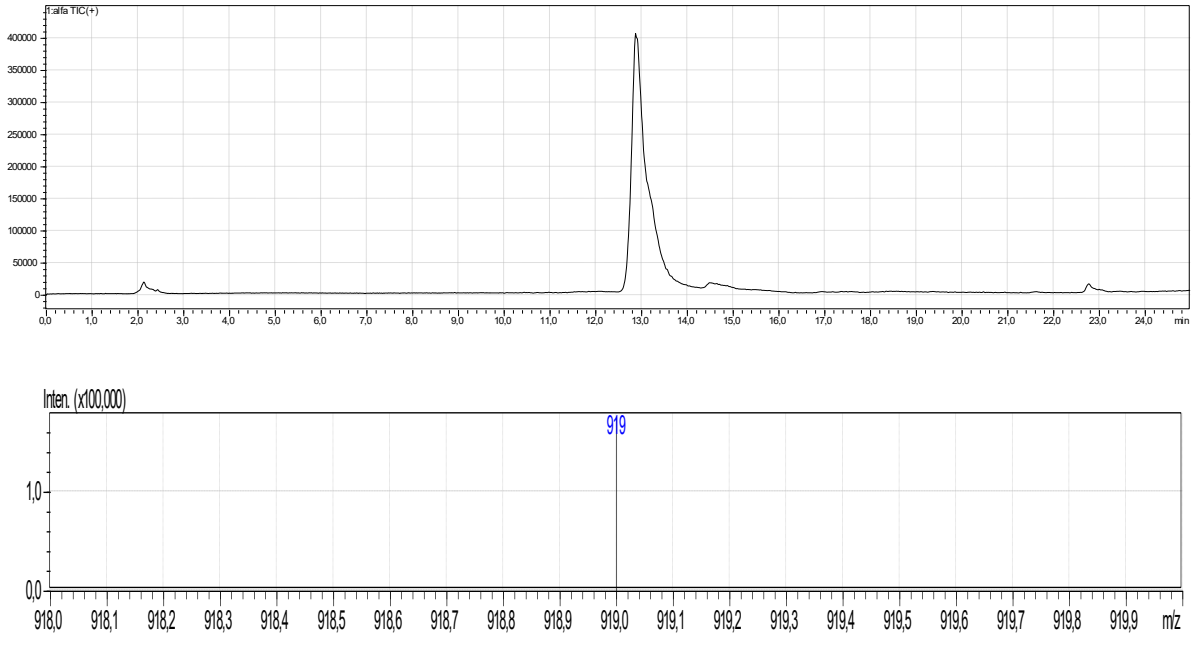


Figure 6: Spectrum (upper) and SIM (below) appearance of alpha amanitine

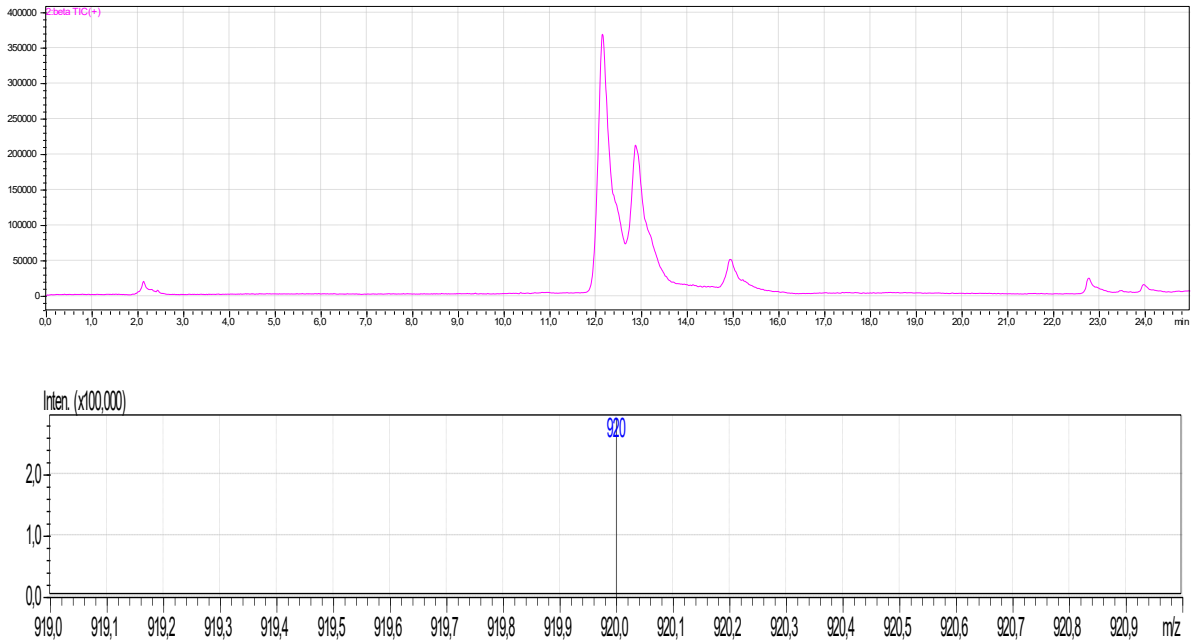


Figure 7: Spectrum (upper) and SIM (below) appearance of beta amanitine

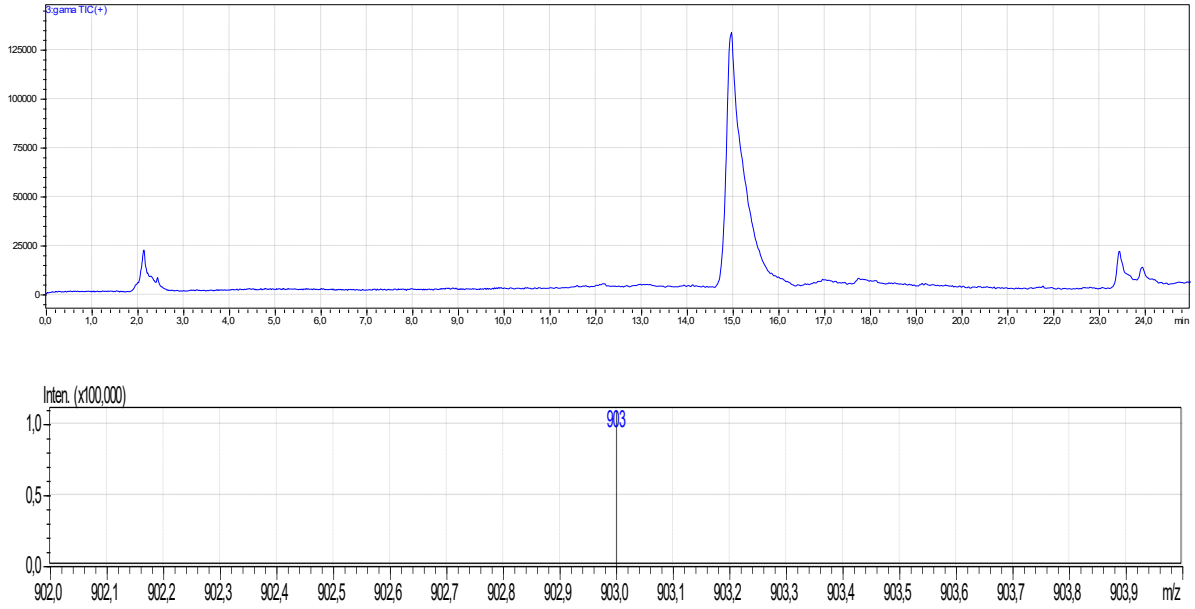
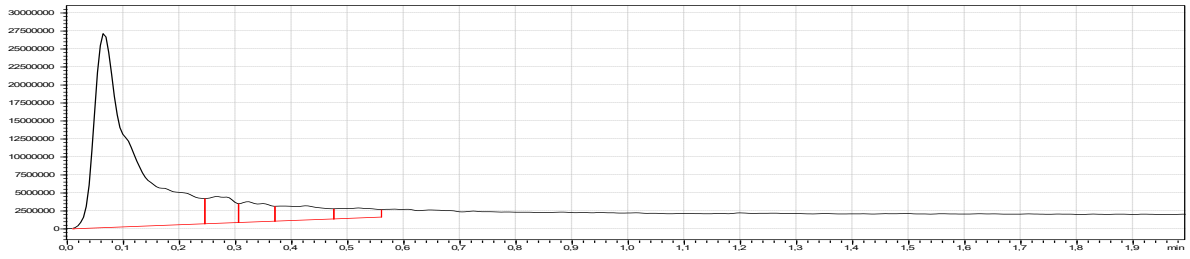


Figure 8: Spectrum (upper) and SIM (below) appearance of gamma amanitine



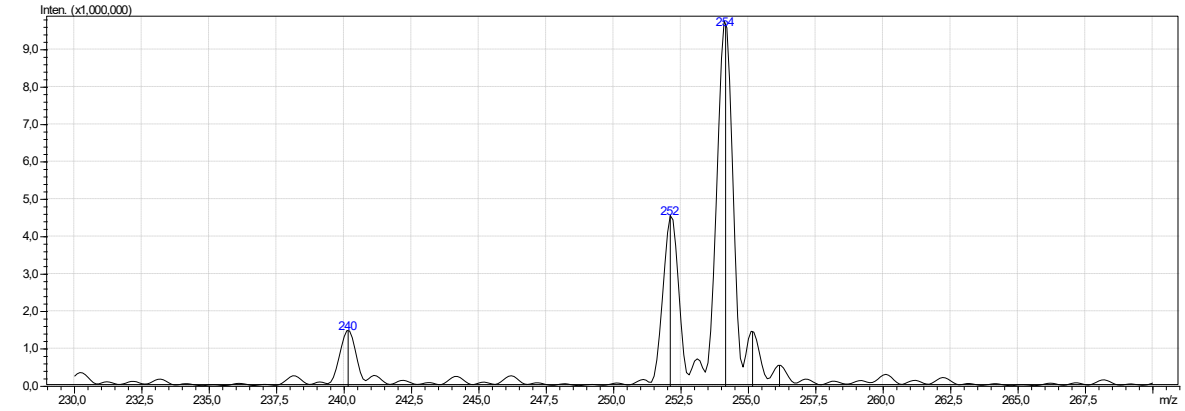


Figure 9: Spectrum (upper) and SIM (below) appearance of orellanine

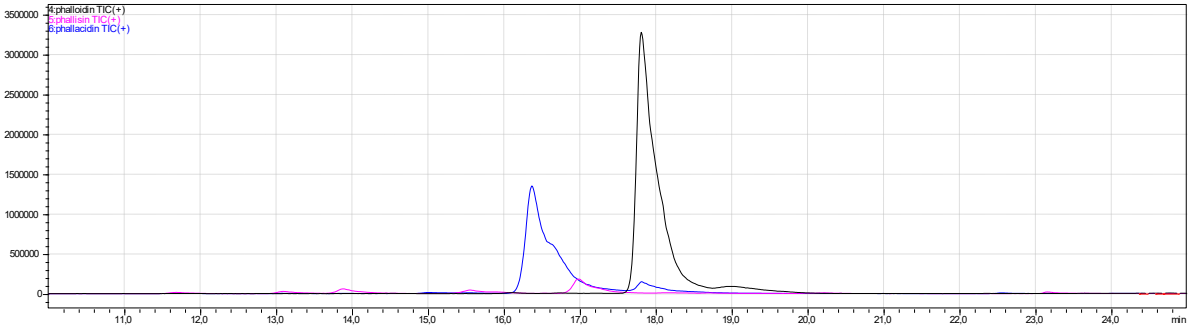


Figure 10: Appearance of phallotoxins in our study in one spectrum

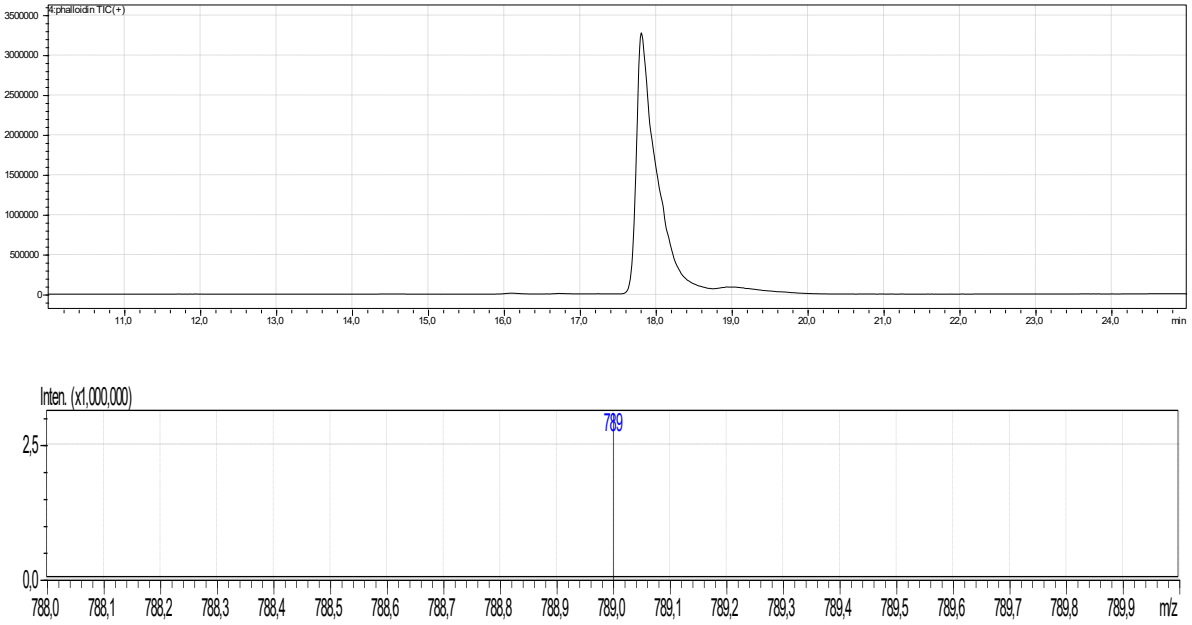


Figure 11: Spectrum (upper) and SIM (below) appearance of phalloidin

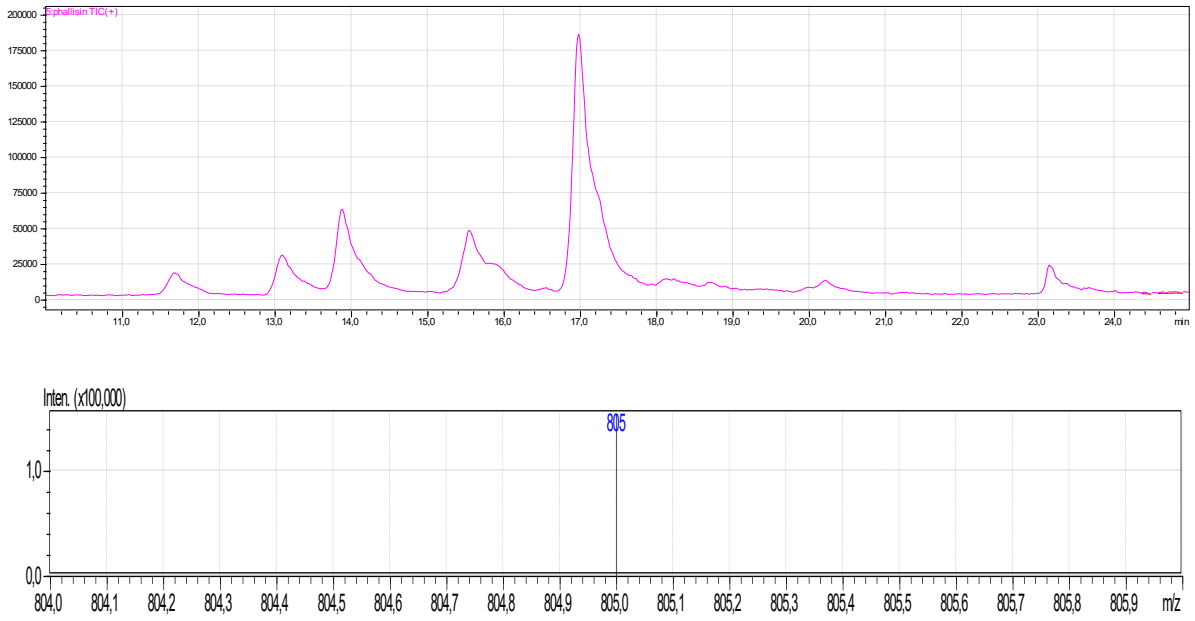


Figure 12: Spectrum (upper) and SIM (below) appearance of phallisin

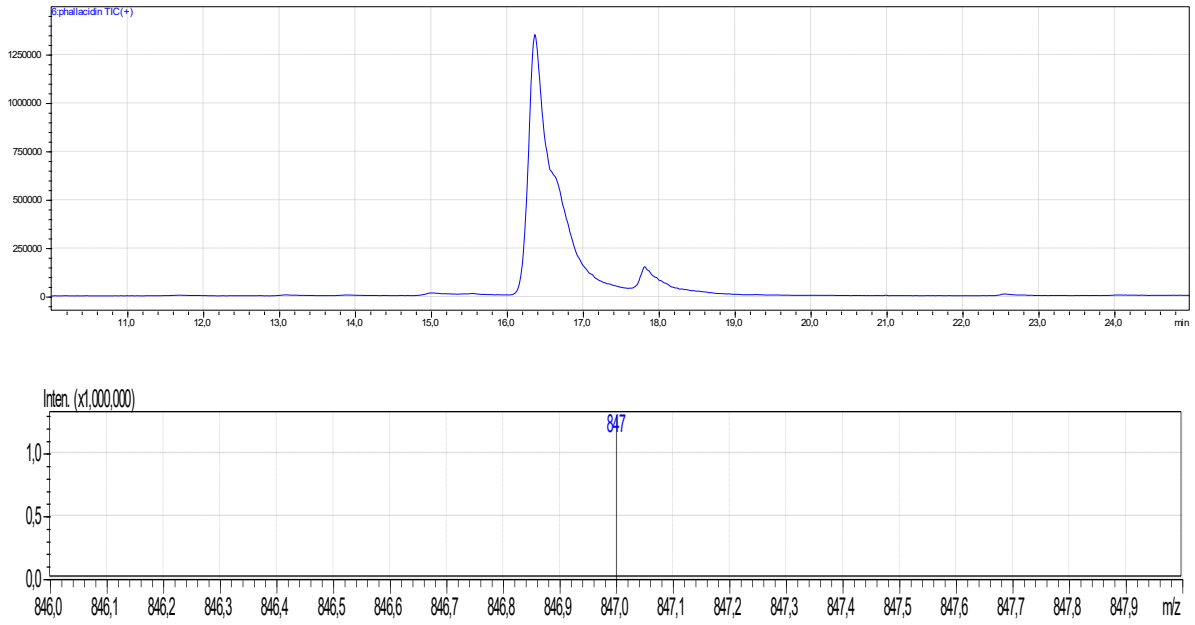
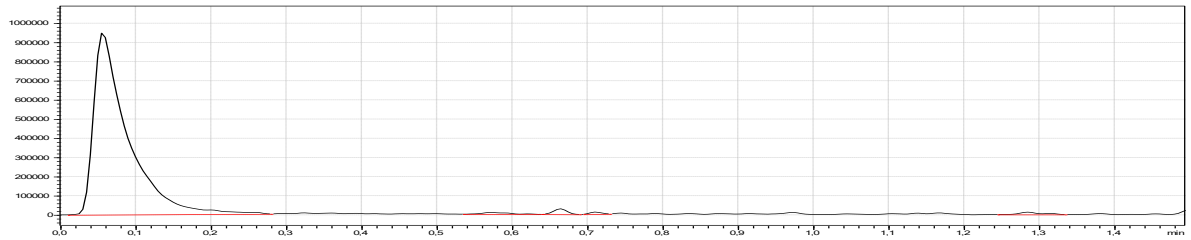


Figure 13: Spectrum (upper) and SIM (below) appearance of phallacidin



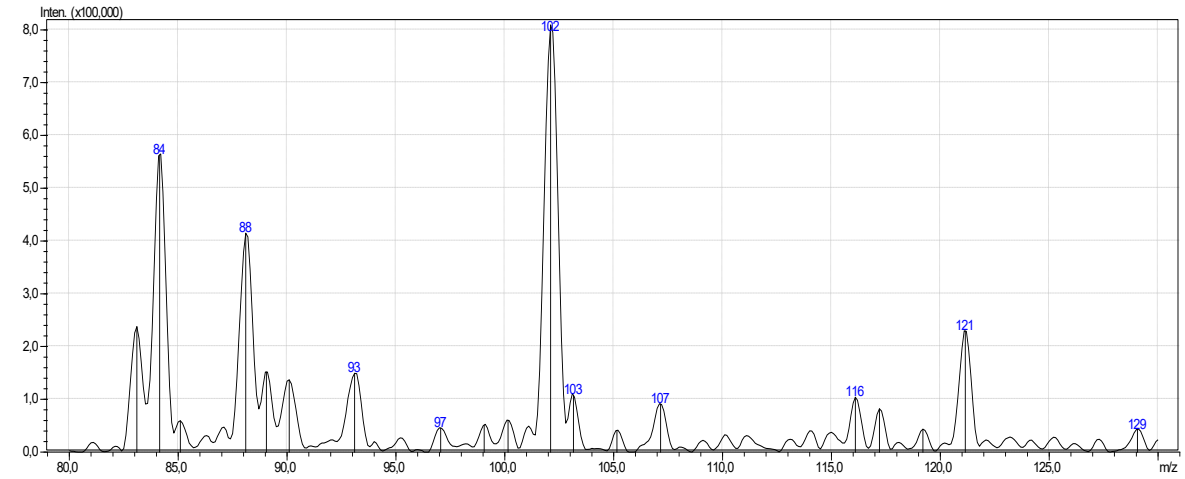


Figure 14: Spectrum (upper) and SIM (below) appearance of muscimol

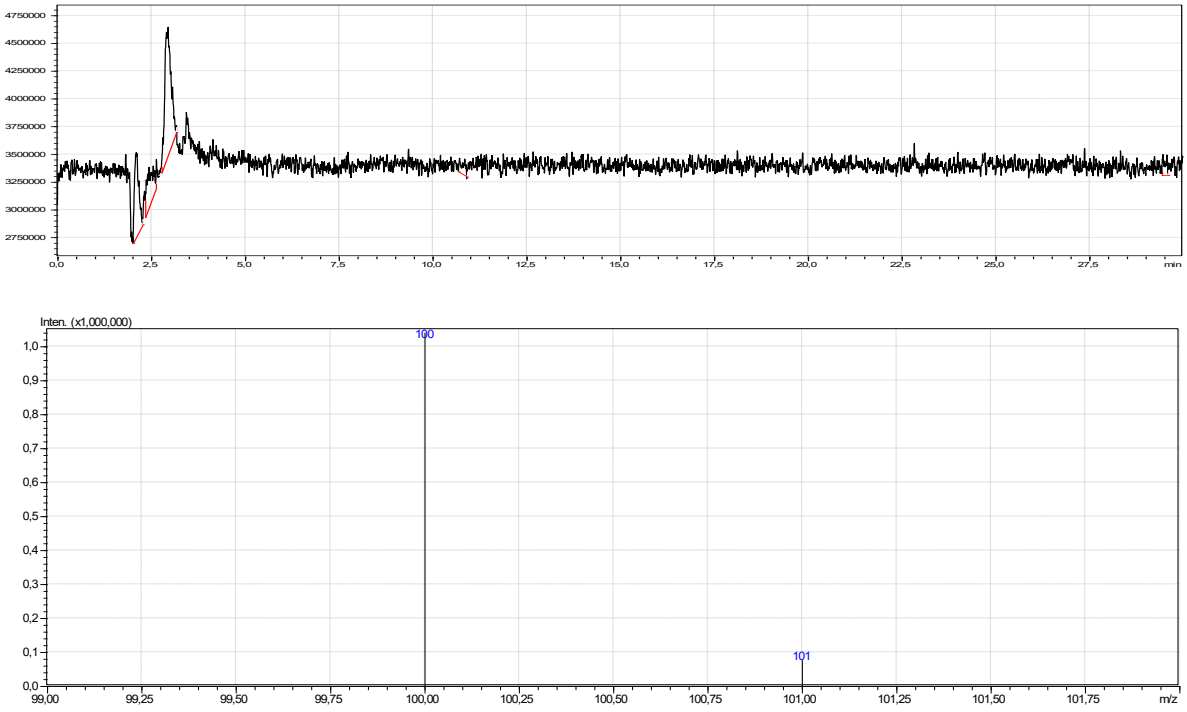


Figure 15: Spectrum (upper) and SIM (below) appearance of gyromitrin

DISCUSSION

In our study, we were able to determine main mushroom toxins such as alpha amanitine, beta amanitine, gamma amanitine, phalloidin, phallisin, phallacidin, muscimol, muscarine iodide, orellanine, ibotenic acid, coprin and gyromitrin with single LC-MS/MS method. With the method we developed, the analysis time of the toxins were completed in 30 minutes. This time period can be considered fast to get the patients' results. LC-MS/MS device is one of the

most sensitive analyzing devices worldwide, it can determine even very small amounts of toxins in the blood samples within the period patients applied to healthcare institutions.

If the method we used in our study can determine toxins from the patients' blood samples, the results will be ready in short time like 30 minutes with the patients who applied with suspect of intoxications. If this method can be used in routine practice, delay in diagnosis can be prevented and patients will be treated immediately. These can lead to decrease mortality and morbidity in mushroom intoxications.

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O-29 EFFECTS OF ERDOSTEINE ON BETA-AMANITIN INDUCED HEPATOTOXICITY ON HUMAN C3A HEPATOCYTE CELL LINE

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INTRODUCTION

The Amanitaceae family is responsible for nearly 95% of all fatal mushroom poisonings. Although primarily alpha amanitin is held responsible for lethal mushroom poisonings, beta amanitin have also been shown in a few studies to have similar cytotoxic actions. The quantities of alpha amanitin and beta amanitin are similar, and these toxins have been found more commonly than any other toxins in the Amanita mushrooms. These toxins have similar structures, except in the R substituent. While, alpha amanitin contains an amino group and is neutral, beta amanitin contains carboxyl and is acidic.

Although various agents are being used today against amanitin poisonings, there is still no specific and fully efficient antidote for its treatment. Erdosteine is a mucolytic. It is a homocysteine-derived thiol derivative with mucolytic and free radical scavenging properties. It has been known to have protective effects on various tissues and liver in particular. Lately, we showed that erdosteine have protective effects for alpha amanitin induced hepatotoxicity in mice.

The aim of this study was to investigate the possible beneficial effects of erdosteine in the prevention of beta amanitin induced hepatotoxicity in a human C3A hepatocyte cell line.

METHOD

For this study, beta-amanitin was purified from *A. phalloides* mushroom using the preparative HPLC (high performance liquid chromatography) method as described in the literature. Three hours after administering beta amanitin in different concentrations (1, 10, 25 and 50 µg/mL), erdosteine was administered in various concentrations (1, 10, 50, 100 and 250 µg/mL) on the cells in a C3A human hepatocyte cell line. The MTT [3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide] test was used to determine cell viability. The average absorbance values of control group were accepted as 100%. The average absorbance values of other samples were calculated by comparing to control groups. Data are given as the mean value ± SEM. A statistical analysis was performed using one-way ANOVA and post-hoc Tukey tests.

RESULTS

While no toxicity was formed in 1 µg/mL concentration of beta amanitin provided in 1, 10, 25 and 50 µg/mL concentrations in cell culture, 50 µg/mL concentration annihilated cell viability entirely. 10 and 25 µg/mL concentrations of beta amanitin was found to decrease cell viability down to (a level of 88%, 69%, respectively) after 48 hours due to its toxic effect on the liver cells in the cell culture (Figure 1).

When erdosteine was applied with different concentrations such as 1, 10, 50, 100 and 250 µg/mL, the cell viability rates were determined as 115%, 119%, 116%, 105% and 102%, respectively (Figure 2).

When 10 µg/mL beta amanitin was applied to the cell lines in which toxicity was composed, different erdosteine concentrations such as 1, 10, 50, 100 and 250 µg/mL, resulted the cell viability rates as follows; 136%, 142%, 143%, 137% and 120%, respectively. However, when erdosteine was applied with the same concentrations in 25 µg/mL beta amanitin toxicity, cell viability rates were determined as 113%, 107%, 107%, 106% and 86%, respectively (Figure 3). Erdosteine significantly decreased toxicity formed with 10 µg/mL beta amanitin in C3A cell culture at all concentrations, it even increased cell viability more distinctly at low concentrations ($p<0.01$). Nevertheless, low-concentration erdosteine totally extinguished toxicity composed with 25 µg/mL beta amanitin more apparently than high-concentration erdosteine ($p<0.05$). High-concentration erdosteine (250 µg/mL) inhibited toxicity statistically significantly compared to the beta amanitin control group; however this inhibition was less effective than the other concentration groups.

CONCLUSIONS

Our results showed that erdosteine may have protective effects for beta amanitin induced hepatotoxicity. While our previous in vivo findings showed that erdosteine prevented mild alpha amanitin toxicity almost totally and medium and severe toxicity to a large extent; this study demonstrated that erdosteine entirely inhibited heavy beta amanitin toxicity even in "not-so-high" concentrations. It raised cell viability at all concentrations in low toxicity, on the other hand, less at high concentrations.

Finally, according to our results, it may promise great hope as a new therapeutic agent in treating amanitin-related mushroom poisonings.

Key words: Beta amanitin, hepatotoxicity, erdosteine, C3A human hepatocyte cell line, hepatoprotection.

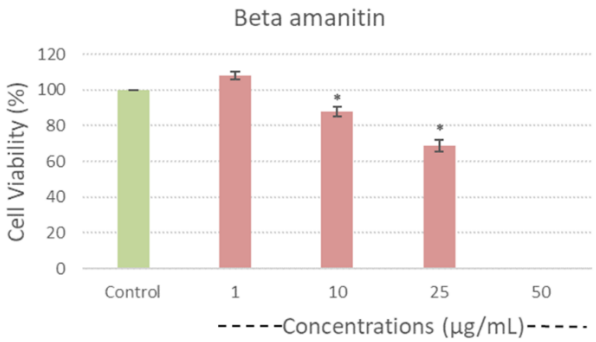

Figure 1. Effects of different beta amanitin concentrations on human C3A hepatocyte cell line

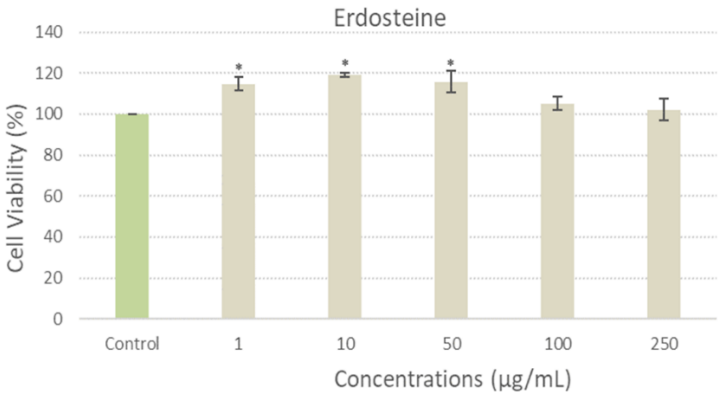

Figure 2. Effects of erdosteine on human C3A hepatocyte cell line

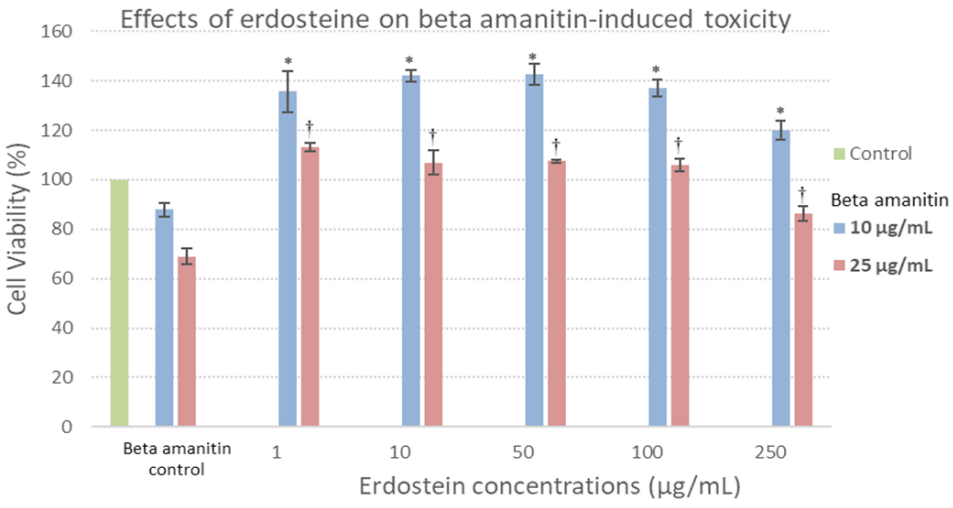

Figure 3. Effects of erdosteine on beta amanitin induced hepatotoxicity on human C3A hepatocyte cell line

P-01 LC-MS/MS METHOD FOR THE ANALYSİS OF EXPLOSİVES RESİDUES ON REAL SAMPLES

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Objective

Sensitive, rapid and inexpensive methods for explosive determination in samples of explosive debris and environmental samples (water, soil etc) are important in order to determine type of explosive substances used in explosion and to match with previous events are increasing. In this study, liquid chromatography atmospheric pressure chemical ionization mass spectrometry LC-APCI-MS-MS was used in order to determine trace amounts of widely used 18 explosives in soil.

Materials-Methods

The method was developed for qualitative determination purpose. No method was encountered in the literature regarding simultaneous determination of these substances in soil matrix. The cleavage products for TNT (trinitrotoluene), RDX (1,3,5-trinitroperhydro-1,3,5-triazine), HMX (cyclotetra methylene-tetranitramine), PETN (pentaerythritoltetranitrate), TETRYL (2,4,6-trinitrophenyl-N-metilnitramine), 2,6-DNT (2,6-dinitrotoluene), TMETN (trimethylolethane-trinitrate), DPA (Diphenylamin), EC (ethyl centralite), MC (methyl centralite), 4-Nitrodiphenylamine (4-nDPA), 2-Nitrodiphenylamine (2-nDPA), Hexanitrodiphenylamine (HND, Hexyl, Dipicrylamine), NG (Nitroglycerin), NTO (5-Nitro-2,4-dihydro-3H-1,2,4-triazol-3-on), HNS (Hexanitrostilbene), PYX (2,6-bis,bis(picrylamino)-3,5-dinitropyridine), N-nitrosodiphenylamine (N-nDPA) and Picric Acid (PA, 2,4,6 trinitrophenol) (which is used as internal standard) were investigated in MS/MS and the signals of m/z ratios were optimized. MS/MS parameters and chromatographic method were optimized through using a gradient ammonium chloride:methanol mobile system and C18 column. The samples were analyzed in LC–MS/MS with APCI negative ionization mode after a 30 min single-step extraction procedure.

Results: The applicability of the overall method was demonstrated by the analysis of real soil samples. Those samples were taken from crime scene between 2014 and 2016 years afterwards the terror attacks in İstanbul.

Conclusion

An economical, fast, easy, repeatable and selective method with low detection and quantification limit and high recovery was developed for the analysis of TNT, RDX, HMX, PETN, TETRYL, 2,6-DNT, TMETN, DPA, EC, MC, 4-NDPA, 2-NDPA, N-nDPA, HND, NG, NTO, HNS and PYX in soil by using LC-MS/MS with APCI ionization.

Keywords: LC-MS/MS, Explosives, Soil

Table 1III Real Soil Samples

Soil	EC	MC	DPA	2-nDPA	4-nDPA	2,6-DNT	RDX	TNT	PETN	HMX	NG	N-nDPA
1	+	+	+	N.D.	N.D.	N.D.	N.D.	+	N.D.	N.D.	N.D.	N.D.
2	+	+	+	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
3	+	+	+	N.D.	N.D.	N.D.	+	+	N.D.	N.D.	N.D.	N.D.
4	+	+	+	N.D.	N.D.	N.D.	+	N.D.	+	+	N.D.	N.D.
5	+	+	+	+	+	+	N.D.	N.D.	N.D.	N.D.	+	+
6	+	+	+	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	+	+

- N.D. (Not Detected)

P-02 EMERGING POTENTIAL OF MICROFLUIDIC CHIPS IN THE FIELD OF FORENSICS

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In recent years, as in many other fields, on-site detection of diverse analytes in forensics has started to gain more interest. In this vein, microfluidics evolved as an alternative and novel platform for the need in rapid and accurate determination of various substances including illicit drugs, DNA, explosives (or their residues) as well as in monitoring the post-mortem interval.

Microfluidics is defined as the science and technology of systems that process very small amounts of fluids (e.g. 1 nL), using very small channels (tens to hundreds of micrometers) (1). In this study, we sought to summarize the fundamentals and importance of microfluidic systems and their emerging use in forensic studies with some selected examples in literature (2-5) as shown in Table 1. Studies reveal that, as a substitute for standard or traditional tests/methods, microfluidic devices based on different analytical principles such as paper-based analytical devices or others coupled with colorimetric, fluorescent, electrochemical sensing or other detection methods have been developed and tested in real samples such as in detection of cocaine, and textile dye characterization from fibers. The volume of sample required as well as reagents, generally in sub-microliter amounts, also are of note and make microfluidic platforms a useful alternative to current procedures.

In conclusion, since the first hours of a crime scene investigation are usually of critical importance for the forensic analysts to obtain data and insights; the real-time and on-site forensic investigations are of special interest (6). Therefore, portable miniaturized platforms such as microfluidic devices may be of paramount importance in establishment of sensitive and specific tests, ready-to-use on-site, with their potential advantages as user-friendly, portable, inexpensive, and disposable tools in various scenes.

Table 1. Some examples of applications of microfluidic devices in forensic sciences

Analytes/ Analysis	Sample	Methods	Instruments	Advantages	References
tetrahydrocannabinol, morphine, amphetamine, methamphetamine, cocaine, methadone, benzodiazepines	oral fluid specimen	Programmable bio-nano-chip (p-BNC) platform	Bead-loaded chip between transparent PMMA inserts, Laboratory based station and flow cell (including a customized fluorescent microscope equipped with a video camera)	• total assay of multiple drugs in 10 min • sensitive detection (ng/ml) • strong correlation between p-BNC platform and reference method • potential to be used in the future by law enforcement officers for roadside drug testing • possible use in diverse settings such as outpatient/inpatient drug rehabilitation centers, prisons, emergency rooms, workplace.	(2) Christodoulides et al., 2015
methamphetamine, amphetamine, cocaine, oxycodone	complex mixtures in which the controlled substance present at 5-10% (w/w)	microfluidic device	Polarizing microscope, DMRX UV/Vis micro-spectrophotometer microscope	• rapid (completed in < 15 sec) • less than 1 mg sample • reagent use and waste generation 95% less than the traditional methods • limits of detection in picogram range • operator-independent device performance	(3) Bell and Hanes, 2007
cocaine, amphetamine, methamphetamine, opiate, oxazepam, methadone, tetrahydrocannabinol	urine, serum and whole blood	integrated competitive volumetric-bar chart chip (CV-Chip)	competitive ELISA	• total assay of multiple drugs in 10 min • less than 2 µL of sample solution, • confirmed with an LC-MS/MS method	(4) Li et al., 2017
post-mortem interval (PMI) analysis	vitreous humour	paper-based microfluidic devices	no sophisticated instrumentation required	• data from paper devices in good agreement with those of ICP-MS (confidence level of 95%). • capability of providing an immediate estimate of PMI at the crime scene	(5) Garcia et al., 2017

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P-04 MEDROXYPROGESTERONE ACETATE EXPOSURE DURING PREGNANCY

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INTRODUCTION

Medroxyprogesterone acetate (MPA; Farlutal®, DepoProvera®, Divina®) which has antiestrogenic and antigonadotropic activity is a synthetic derivative of progesterone[1]. It is often used in the treatment of secondary amenorrhea, endometriosis, contraception, hormone sensitive cancer treatment, dysfunctional uterine bleeding,etc. Generally, low doses of Farlutal® is used to regulate menstrual cycles in hormonal disorders. It is recommended to avoid using in tromboembolic disorders. In some animal studies, genital (hypospadias, masculinization in females, feminization in males) and non-genital (limb defects, chromosomal abnormalities, spina bifida) congenital anomalies have been reported[1]. In humans, it is suggested that MPA use in early pregnancy was not associated with non-genital malformations[1,2]. However, conflicting data with regard to hypospadias are also available. In this study, we evaluated the outcomes of pregnant women exposed to MPA in terms of teratogenicity.

METHODS

79 pregnant women with an age range of 17-41 years who have been treated with MPA were consulted because of several gynecologic problems by Karadeniz Technical University Teratogenicity Information Service (TIS) between 2000-2017. Age, habituations, consanguineous marriage, Rh incompatibility, abortion history, X-ray, names of drugs, drug dosing and exposure periods were recorded. Gestation weeks were established with ultrasonography. After the review of the data available in the literature, we performed a risk assessment for the pregnant women by considering the additional risk factors. Obstetricians, other physicians and the families were informed about the risk levels proposed due to the drugs

and obstetric history. Birth results were recorded and physical and mental developments of babies were followed up for a year.

RESULTS

All women used MPA during first trimester of pregnancy; 76 by oral route (5-10 mg/day) and 3 by intramuscular route (150 mg). We could not contact 20 of these pregnant women. The outcomes of 59 pregnant women contacted are: 4 spontaneous abortions, 8 therapeutic abortions, one intrauterin exitus at 22th gestation week due to predisposition of thrombosis and one intrauterin exitus at 28th gestation week due to unknown reasons. Although 43 of the infants were healthy, one infant had hypothyroidism and one had minimal atrial septal defect (ASD)-ventricular septal defect (VSD).

Table 1: Concomittant drug exposure with MPA except healthy outcomes

Age	Diagnose	Dose/ day	Periods (weeks)	Concomittant drugs	Other risk factors	Risk assesment	Result
36	Amenorrhea	10mg/ day, 10 tablets	4-5	Hydroxychloroquine prednisolone, paracetamol+ oxolamine citrate+ chlorpheniramine, cefuroxim, thiocolchicoside, diclofenac sodium	-	Mediate	SA
37	Amenorrhea	5mg/day 12 tablets	2-3	-	-	Low	SA

26	Amenorrhea	5mg/day 12 tablets	5-6	Diclofenac potassium, flurbiprofene,sodium alginate+potassium bicarbonate	Smoking (2 cigarettes/day, Consanguineous marriage	Low	SA
33	Amenorrhea	5mg/day 11 tablets	3-5	Clarithromycin, lansoprazole, montelukast, salbutamol, salmeterol + fluticazone, clomipramine, bupropion, quetiapine, desloratadine, bethamethasone + salicyclic acid, desmopressin, metilprednisolone, flurbiprofene, paracetamol	-	Low	SA
25	Amenorrhea	10 mg/day 12 tablets	4-5	Gentamycin, fluconazole, fenticonazole, flurbiprofene, montelukast, terbutaline, salmeterol	-	Low	Hypothyroidism
27	Amenorrhea	10 mg/day 10 tablets	4-5	-	-	Low	ASD-VSD
28	Amenorrhea	5mg/day 6 tablets	6-7	Desogestrel, etinilestradiol	-	Low	Death in 22th week

37	Amenorrhea	5mg/day 12 tablets	2-3	-	-	Low	Death in 28th week

SA: Spontaneous abortion, ASD: Atrial Septal Defect, VSD: Venricular Septal Defect

DISCUSSIONS

In humans, it is reported that MPA increases the risk of perinatal mortality and low birth weight. In this study, six prenatal deaths are remarkable while compared to 43 healthy infants. Predisposition to thrombosis is one of the reasons of prenatal death and it should be noted that progesterone may contribute to thrombosis.

Key words: pregnancy, teratogenicity, medroxyprogesterone acetate,

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P-05 LEVETIRACETAM EXPOSURE DURING PREGNANCY

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INTRODUCTION

Pregnancy is more risk for women with epilepsy than other women. Maternal mortality and gestational complications increased significantly in pregnant women with epilepsy and congenital anomalies are more common in infants (1, 2, 3) The treatment of pregnant women with epilepsy is therefore critical and it may be difficult to balance the fetal and maternal risks associated with antiepileptic therapy. In general, women with epilepsy plan their pregnancies at a time when their seizures are under control. Where possible, single drug use and the lowest effective dose treatments are planned for possible seizures (4).

Nowadays, the inability of first generation antiepileptic drugs (AED) to control seizures in some patients and the side effects have led to the development of new antiepileptic drugs. Levetiracetam is a new generation of piracetam derivative medicine developed for this purpose and used in both partial and generalized type seizures with low interaction potential. LEV, the s-isomer of etiracetam, is marketed as Keppra for the treatment of seizure disorders. In preclinical studies presented in the product label, the incidence of growth restriction and minor skeletal abnormalities was increased in pregnant rats given LEV at a dose level similar to the human dose. LEV is a relatively new AED and, to date, more than 1000 pregnancies have been reported in eight prospective registries with various results (6, 7). There was no adverse effect of maternal levetiracetam treatment during pregnancy in the child's subsequent neurodevelopment, but current studies were limited (8, 9). Malformation rates between these records range from 0% to 2.4%. We aimed to review the results of our pregnant women exposed to LEV.

METHODS

14 pregnant women with an age range of 19-43 years who have been treated with LEV were consulted because of several gynecologic problems by Karadeniz Technical University Teratogenicity Information Service (TIS) between 2000-2017. Information of pregnancies such as age, habituations, smoking, alcohol, consanguineous marriages, Rh incompatibility and

previous pregnancies; abortion history, exposure of radiation, drugs, doses of drugs and duration of exposure were recorded. Gestation weeks were established with ultrasonography. After the review of the data available in the literature, we performed a risk assessment for the pregnant women by considering the additional risk factors. Postnatally, we have received delivery information of the infants and followed up their development for a year.

RESULTS

5 cases lost to follow-up were excluded. 8 of 9 pregnant women used levetiracetam because of the diagnosis of epilepsy, and one for the diagnosis of meningioma. 7 of 9 women with LEV exposure delivered healthy babies. One woman had spontaneous abortions. One fetus had anomaly that was detected at 5.5 months of gestation. The mother had used concomitantly valproic acid. Face and extremity anomalies were detected on that fetus. Pregnancy history of nine pregnant women and information about the drugs they use are detailed in the table (1).

Table-1: Concomittant drug exposure with LEV

Age	**Diagnose**	**Dose (mg/day)**	**Period (weeks)**	**Additional drug**	**Other risk Factors**	**Result**
21	Epilepsy	500	Throughout pregnancy	Valproate	2 spontan abortion	Healthly
31	Epilepsy	500	0-6	Acetominofen+ caffein;diclofenac	-	Healthly
28	Epilepsy	500	Throughout pregnancy	Carbamazepin	Smoking; consanquineous marriage	Healthly
43	Menegioma	250	0-20	Escitalopram; radiotherapy	-	Healthly
23	Epilepsy	250	Throughout pregnancy	-	-	Healthly
25	Epilepsy	1000	Throughout pregnancy	Carbamazepin; clobazam	-	Healthly
24	Epilepsy	750	Throughout pregnancy	Carbamazepin	Rh incompalibility	Healthly
29	Epilepsy	2500	0-4	Carbamazepin		
30	Epilepsy	2000	0-22	Valproate		

CONCLUSIONS

One congenital malformation was observed in infants exposed to LEV and valproic acid. It is thought that this anomaly probably is associated with valproic acid. The “safety” of LEV exposure in the first trimester should be confirmed with further investigations.

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P-06 RETROSPECTIVE EVALUATION OF PREGNANT WOMEN CONSULTED BECAUSE OF DRUG EXPOSURE DURING PREGNANCY

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INTRODUCTION

A significant number of the pregnant women are exposed to drugs during pregnancy. Treatment may be necessary for diseases diagnosed during or before pregnancy. Virtually all the drugs cross placenta and thus potentially affect the fetus adversely[1,2]. Most of them are excreted into the breast milk and may affect the neonate as well[1,2]. Most of drug use because of this reason is in early stages of pregnancy while mothers are often not aware of their pregnancy. Because of insufficient medical records, data is not satisfactory. The pregnant cases prescribed drugs in the primary or secondary health care units have been consulted by Karadeniz Technical University Teratogenicity Information Service (KTU-TIS) since 1999. After the review of the data available in the literature, obstetricians, other physicians and the families were informed about the risk levels proposed due to the drugs and obstetric history. Overall data were retrospectively reviewed and presented in this study.

METHODS

Age, habituations, consanguineous marriage, Rh incompatibility, abortion history, X-ray, names of drugs, drug dosing and exposure periods were recorded and a risk assessment was performed. Gestation weeks were established with ultrasonography. After the review of the data available in the literature, obstetricians, other physicians and the families were informed about the risk levels proposed due to the drugs and obstetric history. Birth results were recorded and physical and mental developments of babies were followed up for a year.

RESULTS

3997 pregnant women (16-49 age) were consulted and followed up since 1999. 610 kinds of drugs were recorded. The most common drug groups were chemotherapeutics (96), drugs affecting central nervous system (94), drugs affecting gastrointestinal system (60), cardiovascular system drugs (58), analgesic/anti-inflammatory drugs (50), hormones (16),

steroids (30). Pregnancies were resulted in 172 therapeutic abortions, 115 spontaneous abortions. 43 congenital abnormalities were observed among 1744 alive deliveries birth have been observed.

Table 1: The distribution of various risk factors according to age of 3997 pregnant women

Age Groups	Pregnant women Number %	Smoke Number %	Consanguineous marriage Number %	Radiation exposure Number %	Rh Incompatibility Number %
16-25	797 20.0	124 23.5	43 16.3	76 22.3	54 21.0
26-30	1318 32.9	197 37.4	86 32.5	90 26.4	74 28.7
31-35	994 24.9	109 20.7	68 25.8	97 28.4	77 29.8
36-40	592 14.8	69 13.1	38 14.4	58 17.0	39 15.1
41-49	296 7.4	28 5.3	29 11.0	20 5.9	14 5.4
Toplam	3997 100	527 100	264 100	341 100	258 100

Table-2: The distribution of 610 active molecules according to treatment modalities

Drug Groups	**The Number of Sub-Group**	**%**
Chemotherapeutics	96	15.7
Affecting to Central Nervous System	94	15.4
Affecting to Gastrointestinal System	60	9.8

Affecting to Cardiovascular System	58	9.4
Analgesic-Antiinflammatory Drugs	50	8.1
Hormones	16	2.6
Steroids	30	5.0
Other	206	34.0
Total	610	100.0

DISCUSSION

The pregnancy status or planning must be considered while prescribing especially to women of reproductive age. In case of prescribing to women who are not aware of pregnancy mainly in early stages, information and consultation of such cases by TIS has a critical and an important role especially for preventing curettage intervention clinically not needed. Better performance for TIS units is possible when such units are organized at a national level.

Key words: pregnancy, teratogenicity, malformation

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2. Drugs During Pregnancy and Lactation Treatment Options and Risk Assessment, Third Edition, Edited by Christof Schaefer, Paul Peters, and Richard K. Miller

P-07 HYDROXYZINE EXPOSURE IN FIRST TRIMESTER

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INTRODUCTION

Hydroxyzine is a first-generation H_1 receptor antagonist agent, which has indications as treatment of anxiety/agitation, pre-postoperative analgesia/anesthesia, pruritus and emesis. In general, H_1 receptor antagonists, (doxylamine, diphenhydramine etc.) which are known to be safe in pregnant women, are routinely used for hyperemesis gravidarum. However, there are no adequate studies reporting hydroxyzine exposure in pregnant women. Hydroxyzine is contraindicated in the first trimester, it seemed to be teratogenic in mice and rats. Studies cited in teratology databases, Reprotox and TERIS, reported 5 congenital anomalies without any specific defect pattern in 50 pregnancy exposures. A study from Israeli Teratogen Information Service (TIS), involving a follow-up of 20 pregnancies with hydroxyzine exposure in the first trimester reported a case with renal aplasia, shortened femur and tibia in a stillborn fetus (1). According to the manufacturer of the drug, use in the first trimester of pregnancy is contraindicated based on the inadequate human data and the fact that the drug is teratogenic in mice, rats, and rabbits. In this study, we evaluated the outcomes of pregnant women used hydroxyzine in the first trimester of pregnancy.

METHODS

Thirty-nine pregnant women, with age range 23-48, applied to Karadeniz Technical University Teratogen Information Service between 1999-2017, were included in the study. Obstetric history and the demographic information (age, habituations, consanguineous marriage, Rh incompatibility, abortion history, X-ray, names of drugs, drug dosing and exposure periods) of patients were recorded. Gestation weeks were established with ultrasonography. After the review of the data available in the literature, obstetricians, other physicians and the families were informed about the risk levels proposed due to the drugs and obstetric history. Postnatally, we have received delivery information of the infants and followed up their development.

RESULTS

Eleven of 39 women lost to follow-up were excluded. Twenty-two had healthy babies, three had spontaneous abortions and one had elective termination. An infant with left kidney agenesis was born after the concomitant drug exposure. One baby whose mother concomitantly used infliximab and betamethasone had hydrocephaly. A woman with panic attack taking paroxetine additional to hydroxyzine underwent elective termination. The drug exposure was in the first trimester in all pregnant women except two cases.

Table 1: Maternal characteristics of women used Hydroxyzine during pregnancy and outcomes excluding healthy and inaccessible cases

Age	Diagnose	Dose/day	Periods (weeks)	Additional drugs	Other risk factors	Risk assesment	Results
30	Pruritus	12.5 mg/day	7-11	Infliximab, betamethasone, propofol, pantoprazole	-	Mediate	Hydrocephaly
31	Enteral disorder	75 mg/day	5-8	Mebeverine, sulbutamine, tianeptine, alverine	Consanguineus marriage	Low	Spontaneous abortion (at 8th week of gestation)
42	Pruritus	25 mg, only one tablet	4-5	Desloratadine	Consanguineus marriage	Low	Spontaneous abortion (at 14th week of gestation)
33	Depression	50 mg/day	0-5	Carbamazepine, fluoxetine, amitriptyline	Recurrent abortus	Low	Spontaneous abortion (at 6th week of gestation)
28	Panic attack	25 mg/day	3-4	Trifluoperazine, alverine, metoclopramide, paroxetine, diazepam	Smoking	High	Elective termination (at 6th week of gestation)
27	Depression	25 mg/day	4-7	Escitalopram	Smoking	Low	Renal agenesis

DISCUSSION

Although hydroxyzine is a drug labelled as X in the first trimester, in our study 22 of 28 women delivered healthy babies. The left kidney agenesis and hydrocephaly are major malformations observed in our series and the first one is similar to the defect previously reported by Israeli-TIS. The “unsafety” of hydroxyzine use in the first trimester should be checked once again with further investigations and meanwhile its possible relationship with unilateral renal agenesis should be kept in mind.

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Keywords: Teratology, pregnancy, trimester, agenesis, hydrocephaly

P-08 BETAHISTINE EXPOSURE IN PREGNANT WOMEN

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INTRODUCTION

Vertigo is a very disturbing symptom of vestibular system dysfunction. It is experienced as a spinning sensation illusion, patients experience it either as self-motion, or motion of the environment. Betahistine (Betaserc®, Vasoserc®), a histamine analogue, is used especially for the control of vertigo symptoms of Meniere disease[1]. There is no adequate data in Reprotox teratology database about betahistine use in pregnancy[2]. According to the product labeling, there was no teratogenic effects in rabbits[1]. In human, the outcomes of the drug exposure in the first trimester of pregnancy were 21 live births, 2 miscarriages and 3 elective terminations. Although seventeen infants were normal, two baby had patent foramen ovale and one baby had an intestinal malrotation. So, we aimed to review the results of our pregnant women exposed to betahistine.

METHODS

29 pregnant women with an age range of 21-42 years who have been treated with betahistine were consulted by Teratology Information Service (TIS) of Karadeniz Technical University Faculty of Medicine between 1999-2017. Their common indication of drug use was vertigo. They all used the drug in the first trimester. Age, habituations, consanguineous marriage, Rh incompatibility, abortion history, X-ray, names of drugs, drug dosing and exposure periods were recorded. Gestation weeks were established with ultrasonography. After the review of the data available in the literature, obstetricians, other physicians and the families were informed about the risk levels proposed due to the drugs and obstetric history. Birth results were recorded and physical and mental developments of babies were followed up for a year.

RESULTS

2 cases lost to follow-up were excluded. 20 of 27 women with betahistine exposure delivered healthy babies. Two women had spontaneous abortions. One of them concomitantly used ramipril, duloxetine, trimetazidine and spiramycin, and the other used sertraline, trazodone

and trimetazidine in addition to betahistine. One baby had gastroesophageal reflux. One woman who underwent elective abortion was concomitantly exposed to paroxetine. Moreover, there was a woman who was concomitantly exposed isotretinoin underwent elective termination at 6th week of gestation.

Table 1: Maternal characteristics of women used Betahistine during pregnancy and outcomes excluding healthy and inaccessible cases

Age	Diagnose	Dose/day	Periods (weeks)	Additional drugs	Other risk factors	Risk assesment	Results
21	Vertigo	40 mg/day, totally 19 tablets	1-3	Trimethazidine, sertraline	-	Low	Gastroesophageal reflux
28	Vertigo	Totally 48 mg	Within first 2 weeks	Isotretinoin, acethylsalysilic acid, noretisterone	-	Low	Elective termination (at 6th week of gestation)
32	Vertigo	Unknown	Within first 3 weeks	Medroxyprogesterone, paroxetine, trimetazidine	-	Low	Elective termination (at 6th week of gestation)
40	Vertigo	Totally 24 mg	5-6	Esomeprazol, acethylcysteine, dimenhydrinate, passiflora incarnata, Antiacid, Ferrum proteinsuccinilate+calcium folinate, parasetamol+ chlorpheniramine maleate+codeine, chlorhexidine+ benzidamine, azitromycine, amoxicillin clavulonate, citalopram	-	Mediate	Elective termination (at 8th week of gestation)

33	Vertigo	48 mg/day	0-4	Ramipril, duloxetine, trimetazidine, spiramycine	Smoking	Low	Spontaneous abortion (at 6th week of gestation)
35	Vertigo	48 mg/day	0-4	Sertraline, trimetazidine, trazodone	-	Low	Spontaneous abortion (at 7th week of gestation)

DISCUSSION

No congenital malformation was observed in 20 infants exposed to betahistine in the first trimester of pregnancy. These findings, however, do not exclude possible teratogenic risks of betahistine. Additional studies are needed to confirm the safety of betahistine use in pregnancy.

Keywords: Vertigo, pregnancy, malformation, abortion, termination

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P-10 EFFECTS ON DRIVING SAFETY OF DRUGS USED FOR PSYCHIATRIC TREATMENT; CASE PRESENTATION

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INTRODUCTION

Drugs that affect brain function may affect driving performance negatively. Drugs such as benzodiazepines, opioid analgesics, barbiturates, antipsychotics, hypnotics, antidepressants may cause much more serious side effects, especially when used with alcohol or in combination.

PURPOSE

In this case; it is aimed to discuss the person's driving safety and driving skills who used different benzodiazepines (such as clonazepam, lorazepam, diazepam), various antidepressants (venlafaxine), antipsychotic (quetiapine, aripiprazole) drugs and Methyl Fenidate HCl

CASE

Female, 35 years old

Driver in a traffic accident that no one sees, states that she is passenger

Alcohol or drug/substance analysis was not performed immediately after the accident

Few days later confesses that she is the driver

Some witnesses (health officials in the crime scene) say they get alcohol smell

11 days later samples taken with the purpose of searching for hypnotic, narcotic and stimulant substances; result of the analysis

BLOOD

16 ng/ml diazepam,

80 ng/ml nordiazem,

20 ng/ml oxazepam,

2 ng/ml temesepam and 27 ng/ml paracetamol

URINE

7 aminoclonazepam, diazepam,
nordiazem and paracetamol

HAIR

venlafaxine and quetiapine

When the medical records of the case are examined; alcohol abuse was diagnosed in the hospital, and it was understood that treatment were continued under the outpatient conditions.

CONCLUSION

Both diazepam and clonazepam have warnings for drivers in terms of driving safety in their prospectus. Some of those;

- "Like many drugs that affect the central nervous system, diazepam can cause dangerous consequences for vehicle drivers and machine operators, as it can lead to reduced attention and alertness."
- "Use with alcohol can cause drowsiness."

When the characteristics and half-life of the drugs determined by the performed toxicological analysis and the prescription dates of these drugs are compared;

It is determined that the person is under the influence of the clonazepam during the traffic accident and may also be under the influence of the drug named diazepam.

Regardless of the traffic accident, despite the fact that the person is under the influence of clonazepam; tending to drink alcohol and drive this way.

It was concluded that it would be appropriate to assume that the person driving the vehicle under the influence of the drug, which negatively affects her driving ability, constitutes a conscious negligence in the act.

P-12 DEVELOPMENT AND VALIDATION OF AN LC/MS/MS METHOD FOR DETERMINATION OF NEW PSYCHOACTIVE DRUGS IN HAIR

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INTRODUCTION

Abuse of new synthetic drugs, which have psychoactive effects, such as tryptamines, synthetic cathinones and synthetic cannabinoids have presented in parallel with increasing global concern and impose upon lateness appearing between their entry into the drug market and outlaw (1). These substances mimic psychoactive outcome of traditional drugs of abuse and their acute and chronic toxicity in human have been unknown (2).

Development and validation analytical methods for the identification and quantification of these drugs in variable biological matrices is vital significance to study drug metabolism, link clinical results and concluding poisoning symptoms, interpret or update existing laws and enact new regulations. Among different biological matrices, hair allows a border time diagnostic window to investigate drug-related history and demonstrate past intake compared to that of blood and urine (3). Hair sampling is non-invasive and the collected sample is stable and easy to store. Also, the parent molecules ordinary incorporates in hair from the several pathway such as sebum, sweat, bloodstream before the metabolic break-down occur (4–6). Last generation chromatography-tandem mass spectrometry analytical instruments allows researchers to obtain important information about past use, even a single intake by using hair samples (7). There is a need for sensitive, reproducible and reliable technique for analysis of new synthetic drugs having psychoactive effects, that have been been frequently encountered in clinical and forensic toxicology investigations as well as drug-facilitated crimes and workplace drug testing in hair (8).

We developed and validated an analytical method for the analysis 68 synthetic drugs that include their metabolites including tryptamines, synthetic cathinones and synthetic cannabinoids in hair samples using liquid chromatography coupled with tandem mass spectrometry. This analytical method can be approved to be effective for detection in hair of various classes of new synthetic drugs in forensic toxicological applications.

METHODS

The purity of all the analytical standards was at least ≥95%. Dichloromethane, methanol, ultrapure water, n-hexane and ethylacetate were purchased from Merck (Millipore, Bedford, MA, USA). All stock standard solution were prepared in methanol at 1 mg/ml and stored at -20°C until performing. Working solutions were prepared at the final concentration of 100 ng/ml by dilution with methanol. It was used to two extraction methods in order to separate drugs from hair matrice. It was compared methods and selected final method. In first extraction method, hair strands were washed twice with dichloromethane, methanol and ultra-pure water. Hair samples were dried between the different washing steps using sheets of absorbent paper and finely cut into 1-2 mm segments. Hair segments of about 50 mg were introduced in a 15 mL glass tube. The resulting hair sample was fortified with 1 µl of internal standard stock solution (1mg/L jwh-073-d7) and with mix standard solution according to the certain concentrations and validation plan. Then it was done the addition 1 ml 1N NaOH and incubated at 95 °C for 5 min and following incubated in ultrasonic bath for 10 minute. Immediately afterwards, the samples were extracted with 5 ml of n-hexane/ethylacetate 90:10 (v/v). The organic phase was separated, dried under a nitrogen flow at 40 °C and reconstituted with 200 µl of methanol and was injected into the LC-MS/MS system. In second method, the hair samples washed, cut and 50 mg hair aliquots taken into 15 mL glass tubes as in the first method was fortified with 1 µl of internal standard stock solution (1 mg/L jwh-073-d7) and with mix standard solution according to the certain concentrations and validation plan. After the addition of 2 mL of methanol, the samples were incubated at 55 °C for 12 hours. Then, the organic phase was collected and dried under a nitrogen flow at 40 °C. It was reconstituted with 200 µl of methanol and an aliquot of 10 µL was injected into the LC–MS/MS system.

RESULTS & DISCUSSION

The following parameters were investigated according to our standard procedure: specificity, selectivity, linearity range, detection and quantification limits (LODs and LOQs), and intra-assay and inter-assay precision and accuracy. Carryover effect, recovery, and matrix effects were also calculated. A pool of two blank hair samples obtained from different healthy volunteers (two males) was prepared and analyzed as described table. It was selected second extraction method after resulting validation parameters due to the better results (Table 1).

Table 1. Range of calibration, linearity, LOD and LOQ values, recovery, and matrix effect for all analytes in second method.

Compound		Linearity range (pg/mg)	Linearty adj. (R^2)	LOD (ng/mg)	LLOQ (ng/mg)	Recovery * (%)	Matrix effect mean (±%)
1	(S)-AB-FUBINACA	5-1000	0.9962	0.54	1.62	96	7.8
2	2.3 Ethylone isomer (HCl)	5-1000	0.9995	0.65	1.96	81	-0.3
3	5F-ADBICA	5-1000	0.9979	0.30	0.87	103	-60.0
4	5-Methoxy MIPT	5-1000	0.9987	0.62	1.83	111	-17.0
5	AB-CHIMINACA	5-1000	0.9989	0.10	0.30	102	19.0
6	AB-CHIMINICA_M1A	5-1000	0.9992	0.02	0.07	100	32.0
7	AB-CHIMINICA_M3A	5-1000	0.9987	0.24	0.72	86	-3.1
8	AB-FUBINACA-2A	5-1000	0.9977	0.70	2.13	77	-3.7
9	AB-FUBINICA_2B	5-1000	0.9986	0.30	1.10	90	-3.1
10	AB-PINACA	5-1000	0.9999	0.06	0.17	95	-56.0
11	AB-PINACA N-4-hydroxypentyl	5-1000	0.9997	0.11	0.33	102	-21.0
12	AB-PINACA Pentanoic acid	5-1000	0.9994	0.04	0.13	92	-11.8
13	AB-PINACA_N-(5-hydroxypentyl)	5-1000	0.9995	0.03	0.09	101	-15.0
14	ADB-FUBINACA	5-1000	0.9988	2.10	6.40	109	-57.0
15	AKB-48-N-5-OH-Pentyl	5-1000	0.9986	0.21	0.71	106	-35.0
16	AKB-48-N-PA	5-1000	0.9988	1.59	4.80	95	-36.5
17	AKB-48-N (4-fluorobenzyl)	5-1000	0.9982	0.08	0.24	98	-49.0
18	AM-2201	5-1000	0.9996	0.20	0.61	104	-54.6
19	AM-2201-6-OH-indol	5-1000	0.9992	0.11	0.33	101	-30.3
20	AM-2201-4-OH-Pentyl	5-1000	0.9987	0.03	0.09	102	-28.2
21	HU-210	5-1000	0.9968	6.48	19.63	101	36.0
22	JWH-018	5-1000	0.9984	0.07	0.20	101	-46.0
23	JWH-018 OH	5-1000	0.9996	1.61	4.80	96	-26.7

24	JWH-018-N-pentanoic acid	5-1000	0.9996	1.49	4.53	100	-18.1
25	JWH-019	5-1000	0.9993	0.01	0.04	105	-40.0
26	JWH-073	5-1000	0.9997	0.07	0.20	106	-53.0
27	JWH-073 OH	5-1000	0.9978	0.43	1.32	102	-42.1
28	JWH-073-N-(4-Hydroxybutyl)	5-1000	0.9994	0.27	0.82	104	-52.0
29	JWH-073-N-Butanoic acid	5-1000	0.9987	0.67	2.02	99	-29.2
30	JWH-081	5-1000	0.9994	0.23	0.69	102	-50.7
31	JWH-081-4-OH-Naphtyl	5-1000	0.9988	0.11	0.34	102	-42.6
32	JWH-081-N-5-OH-Pentyl	5-1000	0.9995	0.11	0.32	101	-8.4
33	JWH-122	5-1000	0.9989	0.03	0.09	110	-38.6
34	JWH-122-4-OHP	5-1000	0.9984	1.19	3.60	104	-32.3
35	JWH-122-N-5-OH	5-1000	0.9998	1.64	4.97	102	-11.4
36	JWH-200	5-1000	0.9997	0.11	0.33	97	-12.4
37	JWH-201	5-1000	0.9946	0.04	0.13	99	-48.2
38	JWH-203	5-1000	0.9996	0.09	0.27	106	-49.8
39	JWH-203-N-P-A	5-1000	0.9997	5.70	17.90	93	51.8
40	JWH-210	5-1000	0.9996	0.01	0.02	102	-47.1
41	JWH-210-5-OH-Pentyl	5-1000	0.9972	0.02	0.62	107	-33.7
42	JWH-210-5-OH-indol	5-1000	0.9991	0.02	0.61	105	37.8
43	JWH-210-N-4OHP	5-1000	0.9993	0.17	0.52	108	-33.5
44	JWH-210-N-P-A	5-1000	0.9997	0.05	0.15	102	-51.2
45	JWH-250	5-1000	0.9999	0.11	0.34	107	-48.6
46	JWH-250-4-OH-Pentyl	5-1000	0.9961	0.07	0.21	105	-53.5

47	JWH-250-5-OHP	5-1000	0.9989	0.02	0.05	104	-54.3
48	JWH-398-N-5-OH-Pentyl	5-1000	0.9997	0.05	0.15	105	-30.7
49	JWH-398-NPA	5-1000	0.9987	0.16	0.49	101	-29.7
50	MBDB.HCl	5-1000	0.9984	0.74	2.23	103	-16.0
51	RCS-4	5-1000	0.9989	0.19	0.57	102	-48.3
52	RCS-4-5-0H-Pentyl	5-1000	0.9999	0.05	0.15	97	-42.4
53	RCS-4-N-5-Carboxypentyl	5-1000	0.9978	0.21	0.64	95	-26.2
54	RCS-8	5-1000	0.9986	0.31	0.94	104	-54.3
55	UR-144	5-1000	0.9994	0.09	0.27	106	-21.5
56	UR-144-N-5-OH-Pentyl	5-1000	0.9998	0.44	1.32	106	-44.6
57	UR-144-NPA	5-1000	0.9991	1.70	5.14	97	-36.7
58	WIN-55212-2	5-1000	0.9994	0.39	1.19	99	-40.0
59	XLR-11	5-1000	0.9996	0.34	1.04	108	-40.2
60	XLR-11-6OH-indol	5-1000	0.9969	0.25	0.77	102	-3.1
61	XLR-11-N-4-OHP	5-1000	0.9997	0.02	0.08	103	-11.0

*Recovery evaluated at 250 pg/mg

LOD limit of detection. LLOQ lowest limit of quantitation

The study has proven to efficient for detection in hair of various classes of new synthetic drugs in routine forensic toxicological applications. This method provides the potential to the identificate and quanty new psychoactive drugs in hair and in combination with additional postmortem analysis may provide useful information in clinical and forensic toxicology investigations as well as drug-facilitated crimes and workplace drug testing in hair.

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P-13 AN OVERALL VIEW ON THE IMPACT OF DRIVING UNDER THE INFLUENCE OF ALCOHOL, ILLICIT SUBSTANCES, AND MEDICINES ON ROAD SAFETY

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Road traffic crashes are among the top leading causes of death and it has been estimated that about 1.3 million people die and 20-50 million sustain non-fatal injuries each year globally (1). With regard to road safety, alcohol, illicit substances, and prescription or non-prescription medicines have become major concerns. Data underline the impact of alcohol in driving-under the influence (DUI) as expected (2). However, there is a widespread consensus that number of alcohol-related road deaths in many countries is underestimated (3). While official data on drink-driving deaths in the EU is around 13% of all road deaths (4), it has been estimated that the actual rate may be 25% or even more (5). Several extensive projects (e.g., DRUID and ROSITA), and a great number of studies have been conducted in various countries. Driving under the influence of drugs (DUID) or drug-driving remains significantly more complex as compared with drink-driving. Blood-alcohol concentration (BAC) limits are strictly under control in most of the countries, on the other hand legal thresholds for drugs are not always defined (3). Moreover, tremendous increase in drug/substance abuse has raised an equivocal problem. Since road traffic crashes are a leading cause of death among young people, and the main cause of death among those aged 15–29 years (6); the possibility of illicit substance use may exacerbate this problem. Major threats regarding this issue appear as THC (delta-9-tetrahydrocannabinol)- the active ingredient in marijuana; however more potent and uncontrollable synthetic substances are also in focus, and the number increases every day. Another less recognized issue is the safe use of prescription/non-prescription medicines, and their combination with alcohol or other substances.

In view of these data, we sought to review various reports, and we evaluated analytical studies conducted on biological samples of impaired drivers in different countries either obtained in road-site testing or as post-mortem examinations. Data in Turkey appears mostly underlining the BAC determinations, however illicit substances also pose an extremely high risk in our region. Moreover, vigilance on prescription or non-prescription medicines also requires attention. Specifically, the report by Driving Under the Influence of Drugs, Alcohol

and Medicines (DRUID) project, analyzing blood or oral fluid samples from 50 000 drivers in roadside surveys in 13 countries across Europe (7) has revealed an order of, alcohol>THC> benzodiazepines> cocaine>drug/medicine combinations>alcohol-drugs/medicines combination>medicinal opioids> z-drugs>amphetamines>illicit opioids.

In this vein, some complementary methods during patient counselling, such as efficient use of auxiliary labels related with safe use of medicines, and follow-up in scheduled timeframes to provide an efficient solution, have been sampled. Since pharmacies act as one of the first port of call and play a key role in the healthcare system, pharmacists are expected to inform patients about not only safe use of prescription medicines or OTC but also drug and substance use disorders along with other issues. Currently, a limited number of studies regarding medication warnings about safe driving have been published (8,9). Main approaches on medication warnings appear as labels and pictograms. Effectiveness of these applications need to be further evaluated to enhance awareness and risk perception, esp. with regard to benzodiazepines, and other controlled substances (prescription amphetamines), ADHD medications, and some less recognized medications (e.g. antihistamines, antihypertensives). Effective use of detailed package inserts, and integrated software to assist physicians during prescribing and pharmacists in dispensing medicines that may impair driving performance (esp. causing moderate or severe impairments) may be of use. Another point is the possibility of increased sedation and other effects due to interactions between therapeutic agents. In conclusion, with respect to risk of a traffic accident, while high alcohol levels remain the most serious factor; combination of alcohol and drugs or medicines need to be addressed more intensively.

Key words: road safety, alcohol, illicit substances, prescription/non-prescription medicines, pharmacies

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P-14 INVESTIGATION OF COMPOSITION OF ORGANIC GUN SHOT RESIDUE (OGSR) FROM DIFFERENT AMMUNITION

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Objective

Chemical analysis of gunshot residues (GSR) can provide useful information about the resolving of events involving the use of firearms. GSR consists of a complex mixture of organic and inorganic material originating from the firearm, the ammunition and the combustion products formed during the discharge. Traditionally, the analysis of GSR is based on the presence of lead, barium and antimony. Environmental pollution has become a big problem nowadays due to the heavy metals formed after the shooting. For this purpose, heavy metal free and lead free primers (HMF and LF) were produced. Analysis of inorganic GSR from LF and HMF ammunition could possibly lead to false-negative results. As no characteristic inorganic GSR particles are produced by these ammunitions we aimed to analyze organic GSR in capsule and gunpowder in our study

Materials-Methods

A limited number of studies have been published for the analysis and there is no internationally accepted standard analysis method for organic gun shot residue (OGSR). The advantage of the technique developed for the analysis of OGSR is that it can be used in both GSR analysis for heavy metal free ammunition and standard ammunition. In our study, Liquid chromatography atmospheric pressure chemical ionization mass spectrometry (LC-APCI/MS/MS) instrument was used for the analysis of OGSR. 9 mm MKE Yavuz-16 and Smith&Wesson 45cal was used for all experiments. In order to study the influence of the chemical composition of a gunpowder on detected OGSR, six different ammunition were used in shooting sessions. Spent Cartridge, Unburned powder and Swab was analyzed. Picric acid was used as the internal standard (I.S.). Peak areas were used for calculations.

Results

OGSR is originating from gunpowder and primer. Propellant formulations are complex composite materials that consist of a number of additives, stabilizers, burning rate modifiers, and plasticizers. We analyzed DPA (Diphenylamin), EC (ethyl centralite), MC (methyl

centralite), 4-Nitrodiphenylamine (4-nDPA), 2-Nitrodiphenylamine (2-nDPA), NG (Nitroglycerin) (Table 1) which contained in capsule and primer.

Conclusion

The forensic evidence values are reduced when HMF primers are used. Because inorganic gunshot residue (IGSR) have high contamination risk, high secondary transfer rate and absence of characteristic products. Therefore, the analysis of OGSR is of great importance to solve forensic cases. As a new approach in the resolution of the forensic cases committed with firearms, it is aimed to solve forensic cases by means of OGSR detection. The presence of a specific compound can be a good indication for qualitative comparison with ammunition that might be discovered at a suspect's place for example.

Keywords: Organic Gun Shot Residue (OGSR), LC-MS/MS, Explosive, Ammunition

Table 1 Ammunitions

Ammunitions		Explosives						
		2-nDPA	4-nDPA	DPA	MC	EC	N-nDPA	NG
GFL 45 cal	Spent Cartridge	+	+	+	+	+	+	+
	Unburned powder	+	+	+	N.D.	+	+	+
	Swab	+	+	+	+	+	+	+
CCI 45 cal	Spent Cartridge	+	+	+	+	+	+	+
	Unburned powder	+	+	+	+	+	+	+
	Swab	N.D.	+	+	+	+	+	+

GECO 45 cal	Spent Cartridge	+	+	+	+	+	+	+
	Unburned powder	N.D.	N.D.	N.D.	N.D.	+	N.D.	+
	Swab	+	+	+	+	+	+	+

GFL 9mm	Spent Cartridge	N.D.	N.D.	+	+	+	N.D.	+
	Unburned powder	N.D.	N.D.	+	N.D.	+	N.D.	+
	Swab	N.D.	N.D.	+	+	+	N.D.	+

MKE 9 mm	Spent Cartridge	+	+	+	N.D.	N.D.	+	+
	Unburned powder	+	+	+	N.D.	N.D.	+	+
	Swab	+	+	+	N.D.	N.D.	+	+

S&B 9mm	Spent Cartridge	+	+	+	+	+	+	+
	Unburned powder	+	+	+	N.D.	+	+	+
	Swab	N.D.	+	+	+	+	+	+

- N.D. (Not Detected)

P-16 DRUG RELATED DEATHS AMONG FORENSIC AUTOPSIES IN IZMIR BETWEEN 2016-2017

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INTRODUCTION

Drug abuse is a worldwide increasing threat. Drug-induced death can be a consequence of direct, indirect or even long-term effects of exposuring to a particular drug or group of drugs. In this study; it is aimed to have information about the narcotic-drugs and stimulant profiles, prevelans and autopsy findings in the forensic autopsies that is narcotic drugs and stimulants related deaths at Izmir Group Chairman Morgue Department.

METHOD

In our study, autopsies that performend in Izmir Branch of the Council of Forensic Medicine between 2016-2017 were retrospectively examined and 53 patients who were connected to the drug abuse were evaluated. Examination of the autopsy reports revealed the sociodemographic characteristics of the cases, autopsy findings, drug profiles which directly have impact on death. The data were statistically evaluated by processing in the SPSS 22.0 program.

RESULTS

2 of the evaluated cases were female and 50 were male. It is founded that the mean age was 28.2. *(Graphic 1)*

Synthetic cannabinoid users were found to be significantly younger than methamphetamine users. ($p<0,01$) *(Table 1)*

In 20% of all the subjects alcohol was positive.

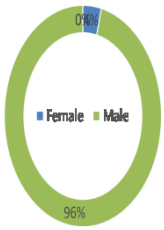
11% of the cases were reported to have been treated in a health facility with the diagnosis of drug abuse earlier.

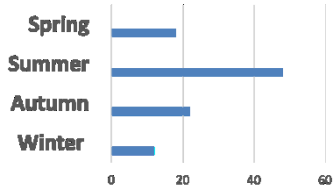
It was seen that 48% of deaths occurred in summer and the least death was in winter season. *(Graphic 2)*

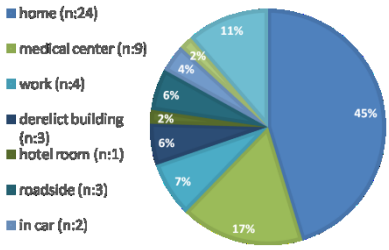
It is recorded that 45% (n:24) of the subjects were founded dead at home. *(Graphic 3)*

When the autopsy findings were evaluated; congestion and edema of the lungs 80%, myocardial hyperemia 30% of the cases were detected. only 4% of the cases had moderate-severe stenosis in the coronary arteries and 84% of the patients had luminal stenosis.

In the analytical tests, it was found that there was no statistically significant relationship between the chemical substances determined by the toxicological examination and the autopsy findings.







Graphic 1: Gender distribution of the cases

Graphic 2: Seasonal distribution of the cases

Graphic 3: Places that the cases were found dead

Table 1: Toxicology results and mean ages

Toxicology Result	Number	Frequency	Mean Age
Synthetic Cannabinoid	15	30,0	25,0000
Amphetamin derivatives	16	32,0	34,8750
Cocaine derivatives	1	2,0	17,0000
Combined	15	30,0	27,4667
Quetiapine	3	6,0	26,6667

CONCLUSION

In our study, amphetamine derivatives (MDA, MDMA, MDEA), were found to be the most frequently detected substance in drug-related death cases and synthetic cannabinoids (5F-ADB, FUB AMB, AB FUBINACA, CUMYL-4CN-BINACA, JWH) in second place. Consistent with the literature, synthetic cannabinoids caused death in a younger age group. It was found that there was no significant statistical relationship between the macroscopic and microscopic findings obtained during autopsy performed directly drug-related death cases.

Therefore, it should be noted that forensic toxicological examination is one of the most important parts of forensic autopsy.

As in the whole world, drug abuse in our country is a serious public health problem. In order to determine the type of abused substances, large-scale mortality studies will be helpful in this area. We believe, constructing these studies would be a useful way of fight with the use of narcotic drugs, sedatives and stimulants.

P-25 THE EFFICIENCY OF SPE CARTRIDGES FOR ILLEGAL SUBSTANCE ANALYSIS IN SWEAT

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INTRODUCTION

Sweat is an alternative biological material for monitoring drug abuse. Illegal substances generally are weak bases with low protein binding facilitating the transfer of lipid-soluble compounds from blood to other fluids and/or tissues. This can lead to an accumulation in biological materials with pH values lower than that of plasma (pH 7.4) or ion trapping of the drugs in the more acidic matrix. Sweat is a slightly acidic matrix, with a pH ranging from 4 to 6.8. The other important factor in the transfer of drug into sweat is the lipophilicity of the compound. In this study, it was aimed to compare the efficacy of different solid phase extraction (SPE) cartridges in the determination of Δ9-Tetrahidrokannabinol (THC), amphetamine and derivatives, morphine, cocaine and benzoylecgonine by Gas Chromatography Mass Spectrometry (GC-MS). This study is supported by TUBITAK 3001 - Starting R&D Projects Funding Program.

METHODS

This study was performed at Ege University, Institute on Drug Abuse, Toxicology and Pharmaceutical Sciences, Addiction Toxicology Laboratory. 500 ng/ml Δ9-THC, amphetamine (AMP), methamphetamine (MET), 3,4-methylenedioxyamphetamine (MDA), 3,4-methylenedioxymethamphetamine (MDMA), morphine, cocaine, benzoylecgonine and internal standards were spiked in to the two different buffer solutions which were pH 4.5 acetate buffer and pH 6 phosphate buffer.

- *Synthetic sweat:* 327 mM ammonium chloride, 166 mM lactic acid, 83 mM urea, 42 mM acetic acid, 34 mM sodium hydroxide in distilled water. The pH was adjusted to 4.7 using 2 mM sodium hydroxide (1).
- *0.1 M Phosphate Buffer (pH=6):* 1.361 g of KH_2PO_4 was weighed to 100 ml with purified water by adding HCl acid to adjust the pH to 6.

- *0.1 M Acetate Buffer (pH=4,5):* 0.771 g of ammonium acetate was weighed to 100 ml with pure water by adding glacial acetic acid to adjust the pH to 4.5.

Clean Screen THC020, Clean Screen DAU, SampliQ C18 and Bond Elut Plexa SPE cartridges were used for extraction. Condition, wash and elution solvents were selected for each cartridges according to their chemical properties.

Table 1. SPE procedures for different cartridges.

Cartridges	**Conditioning**	**Sample addition**	**Washing**	**Elution**
Clean Screen THC020	3 ml methanol 3 ml distilled water 1ml 0.1 M HCI	Sample in 1 ml buffer	2 ml distilled water 2ml acetonitrile: 0.1M HCI (50:50, V/V) 5 min drying	3 ml dichloromethane
Clean Screen DAU	3 ml methanol 3 ml distilled water 1ml 0.1 M HCI	Sample in 1 ml buffer	2 ml distilled water 2ml acetonitrile: 0.1M HCI (50:50, V/V) 5 min drying	3 ml dichloromethane
C18[1]	2 ml methanol 2 ml distilled water	Sample in 1 ml buffer	2 ml distilled water	2 ml methanol
C18[2]	2 ml methanol 2 ml distilled water	Sample in 1 ml buffer	2 ml distilled water	1 ml methanol with %2 ammonia
Bond Elut[1]	2 ml methanol	Sample in 1 ml buffer	1 ml acetik acide 6 ml methanol	2 ml ethyl acetate
Bond Elut[2]	2 ml methanol	Sample in 400 µl buffer	2 ml %5 methanol: water	2 ml methanol

	2 ml distilled water			

After elution, samples were dried under nitrogen stream. Dried extracts were reconstituted using appropriate derivatization agents. Then, transferred to vials and 1 µl of aliquot injected to GC-MS.

RESULTS

The best results were obtained with C18 cartridges for Δ9-THC, amphetamine, methamphetamine, MDA, cocaine, benzoylecgonine and morphine standards at different pHs (4,5 and 6) . No analyte was detected in the Clean Screen THC020 and Bond Elut Plexa SPE cartridges. Only Δ9-THC was detected in the Clean Screen DAU SPE cartridge at pH = 4,5 and 6.

Table 2. Efficiency of analytes analyzed at different pHs with different SPE cartridges

Cartidges	pH	Δ9-THC (Cannabis)	Morphine	Cocaine	Amphetamine
Cleen Screen THC020	4,5	-	-	-	-
	6	-	-	-	-
Cleen Screen DAU	4,5	+	-	-	-
	6	+	-	-	-
C18[1]	4,5	+	+	+	+
	6	+	+	+	+
C18[2]	4,5	-	-	-	-
	6	-	-	-	-
Bond Elut[1]	4,5	-	-	-	-
	6	-	-	-	-
Bond Elut[2]	4,5	-	-	-	-
	6	-	-	-	-

DISCUSSION

Forensic toxicological analyzes have an important place in the anti-drug effort system. In this context, it is important to obtain accurate and reliable results with sensitive methods. Sample preparation stage is an important part of the forensic toxicological analyzes performed on biological materials such as sweat. Thus, in this study simultaneous analysis of acidic and basic analytes was performed, different cartridges were studied for solid phase extraction and C18 was selected as the most effective cartridge.

Key words: Sweat, Solid Phase Extraction, Drug analysis, Chromatography

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P-29 CLINICALLY SIGNIFICANT DRUG-DRUG INTERACTIONS THAT ENHANCE ANTICOAGULANT OR ANTIPLATELET EFFECTS IN THE ELDERLY INPATIENTS

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INTRODUCTION

Thrombosis is considered to be a common pathology for diseases such as ischemic heart disease, ischemic stroke or venous thromboembolism (1). Thrombotic diseases are the leading causes of death. Platelets play the most important role in arterial thrombosis via formation of aggregates. Antiplatelet treatment with drugs such as aspirin, clopidogrel, ticlopidine, dipyridamole, abciximab and tirofiban can help to avoid this process (2,3). Enoxaparin and heparin are well-known and frequently used drugs for their anticoagulant effects. Addition to widespread used antiplatelets, acetylsalicylic acid and clopidogrel, selective serotonin reuptake inhibitors (SSRIs) have also antithrombotic effects. Co-administration of antiplatelet and anticoagulant drugs may show additive effects and can increase the risk of bleeding. The risk rating category for drug-drug interactions (DDIs) between antiplatelets and anticoagulants according to Lexi-Comp Online Drug Interaction database is 'C' which is defined as ''The benefits of concomitant use of these two medications usually outweigh the risks. An appropriate monitoring plan should be implemented to identify potential negative effects'' (4). The aim of this study was to evaluate DDIs between antiplatelets and anticoagulants in the elderly patients of intensive care unit (ICU) at Marmara University Education and Research Hospital.

METHODS

Database of Medical Pharmacology Department was retrospectively analyzed for consultation reports of surgical ICU patients between 03.01.2018-28.06.2018. Medication charts of the patients were checked for concomitant use of antiplatelets and anticoagulants. Lexi-Comp Online Drug Interaction database was used for evaluation of DDIs.

RESULTS

There were 163 consultation reports for surgical ICU. Of the 163 reports, 21 (13 %) had DDIs between antiplatelets and anticoagulants. Combination of enoxaparin and acetylsalicylic acid was the most frequent DDI (43 %, n=9) among these patients. Six patients (28 %) were found to be treated with enoxaparin, acetylsalicylic acid and clopidogrel. Two patients (9 %) had potential DDIs between enoxaparin and escitalopram. Concominant use of 4 interacting

drugs, enoxaparin, acetylsalicylic acid, clopidogrel and escitalopram was detected in 1 patient. Rest of the 3 patients was found to use combination of 3 interacting drugs, including enoxaparin, heparin, acetylsalicylic acid or ticagrelor (Table 1).

Table 1. The number of patients treated with antithrombotic and anticoagulant drugs

Drugs	Number of patients : n	%
Enoxaparin + Acetylsalicylic Acid	9	43
Enoxaparin + Acetylsalicylic Acid + Clopidogrel	6	28
Enoxaparin + Escitalopram	2	9
Enoxaparin + Acetylsalicylic Acid + Clopidogrel + Escitalopram	1	5
Enoxaparin + Heparin + Acetylsalicylic Acid	1	5
Enoxaparin + Acetylsalicylic Acid + Ticagrelor	1	5
Heparin + Acetylsalicylic Acid + Ticagrelor	1	5

CONCLUSIONS

DDIs between antiplatelets and anticoagulants may result with clinically important and life-threatening bleeding effects. The anticoagulants have been shown to enhance bleeding whereas antiplatelet drugs can result with ulcers and erosions in the gastrointestinal tract (5). Combination of anticoagulants and antiplatelets has been reported to be associated with an increased risk of epistaxis, bleeding after dental extraction or gastrointestinal bleeding (6-8). Gastrointestinal bleeding is a very serious emergency problem for the patients on anticoagulant and antiplatelet drugs (7). To be an elderly patient, to have an underlying pathology or a history of hemorrhage were defined as the risk factors for occurrence of gastrointestinal bleeding in the patients on antithrombotic therapy (5).

In conclusion elderly inpatients that are at higher risk for DDIs with altered pharmacokinetics, polypharmacy and co-morbidities, should be monitorized closely for bleeding symptoms related with potential DDIs not only with well-known antiplatelets and anticoagulants but also with SSRIs.

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P-30 EVALUATION OF MEDICATION ORDERS OF INTENSIVE CARE UNIT PATIENTS FOR THE CO-ADMINISTRATION OF CNS DEPRESSING DRUGS

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INTRODUCTION

The potential for the occurrence of drug-drug interactions (DDIs) is high in intensive care units patients (ICU) due to alterations in pharmacokinetics of drugs in the older age of ICU patients with polypharmacy and co-morbidities (1,2). DDIs can lead to life-threatening adverse/toxic effects or therapeutic failure. There are 5 risk rating categories of DDIs identified as A B C D and X according to Lexi-Comp Online Drug Interaction database. Especially, DDIs in the X, D and C risk rating categories can lead to clinically important outcomes (3). Co-administration of central nervous system depressing drugs (CNS-Ds) can result with clinically important DDIs and may cause respiratory depression or excessive sedation as a result of suppression of CNS. We aimed to determine the multiple use of CNS-Ds and possible DDIs in the intensive care unit (ICU) patients.

METHODS

Surgical ICU patients (n=58) who were consulted to Medical Pharmacology Outpatient Clinics at Marmara University Hospital between 03.01.2018 and 25.07.2018 were included in this study. Multiple use of CNS-Ds were checked from the medication charts of the ICU patients. Potential DDIs of CNS-Ds were detected by using the risk rating categories of the Lexi-Comp Online Drug Interaction database.

RESULTS

Of the 58 ICU patients, 31 % were found to have multiple use of CNS-Ds. Co-administration of 2 drugs (21 %), 3 drugs (8 %) and 5 drugs (1 %) were detected among the medication charts of the patients. The most frequently used CNS-Ds in the ICU patients were levetiracetam (n=33, 57 %), tramadol (n=33, 57 %), remifentanil (n= 28, 48 %) and propofol (n= 13, 22 %). Fentanyl (n= 6), quetiapine (n= 5), morphine (n= 4), pregabalin (n= 3), clonazepam (n= 2) and midazolam (n= 1) were the other CNS-Ds contributing to potential DDIs. The most frequent potential DDI was between levetiracetam and tramadol (29 %, n= 17). This combination was a D risk rating category DDI which should be avoided. Levetiracetam and remifentanil (n= 16), tramadol and remifentanil (n= 11), remifentanil and propofol (n= 7)

and levetiracetam and propofol (n= 6) were the other combinations for potential DDIs that can lead to clinically important CNS effects.

Table-1. CNS-Ds in medication charts

Number of CNS-Ds	Percentage (%) of medication charts with CNS-Ds
2 drugs	21
3 drugs	8
5 drugs	1

Table-2. Types of the most frequent CNS-Ds consulted by surgical ICU

CNS-Ds used in surgical ICU	Patients using CNS-Ds (%)
Levetiracetam	33 (57)
Tramadol	33 (57)
Remiphentanil	28 (48)
Propofol	13 (22)

CONCLUSIONS

DDIs between CNS-Ds can be more vital for ICU patients due to multiple pharmacotherapies, the severity of illness, co-morbidities and organ failure (3). Use of CNS-Ds, particularly combination of antipsychotics and antidepressants, can lead to a life-threatening state (4,5) which takes place in the X risk rating category of Lexi-Interact database. According to our results the most frequently used CNS-Ds were levetiracetam, tramadol, remifentanil and propofol which should be carefully monitorized for clinically important DDIs that can result with slowed or difficult breathing, increase in seizure risk and deaths (6-8). Co-administration of levetiracetam, an antiepileptic drug, and tramadol, an opioid, should be carefully monitored in the ICU patients if modification of the therapy is not possible. This combination is a D risk rating category DDI which may need a change in dose or drugs and

may increase the risk of side effects such as confusion, dizziness, drowsiness, difficulty in concentrating and impairment of motor coordination especially in the elderly patients. Identification of DDIs, evaluation of their clinical severity, monitorization of the patient and changing the dose of drug or the drug to an alternative one may help to prevent complications (9,10). In conclusion detection and prediction of the potential DDIs between CNS-Ds may enhance clinicians to prevent clinically important CNS depressive effects and can improve patient safety.

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P-31ANALYSIS OF POTENTIAL DRUG-DRUG INTERACTIONS LEADING TO QT INTERVAL PROLONGATION IN THE INTENSIVE CARE UNIT PATIENTS OF A UNIVERSITY HOSPITAL

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INTRODUCTION

Measurement of QT interval is over 460 milliseconds in men and over of 470 milliseconds in women which are defined QT-interval prolongation (1) which can be congenital or acquired (2). Drugs are the most common etiology associated with acquired QT prolongation (3). Medications that cause QT prolongation are generally cardiac drugs (mostly antiarrhythmics) and sometimes other medications such as antihistamines, antipsychotics, antidepressants, antibiotics, and etc. (4). Concomitant administration of those medications can cause clinically significant drug-drug interactions (DDI) which may lead to life-threatening tachyarrhythmias especially in critically ill patients. Also many risk factors that may influence the patient's risk for QT interval prolongation development such as female sex, age over 65 years, bradycardia, hypokalemia, hypomagnesemia, underlying heart disease, and genetic predisposition (5). DDIs may be a significant cause of QT prolongation in intensive care unit (ICU) patients (6). In this study we analyzed the medication orders for the potential DDIs leading to QT-interval prolongation in ICU patients of Marmara University Hospital.

METHOD

Regular DDI consultation reports for ICU patients by medical pharmacology department in our university hospital were retrospectively analyzed for 6 months (01 January - 30 June 2018). The study is focused on clinically important DDIs which are in the C, D, or X risk rating categories of the Lexi-Comp Online Drug Interaction database (Table 1) (5).

Table 1. Categories of clinically important DDIs.

Risk category of DDIs	Clinical importance
X	Combination should be avoided because of concomitant use significantly increases the risk of adverse effect.

D	Consider therapy modification that include aggressive monitoring, empiric dosage change or switching to alternative agents.
C	Needs the monitoring of therapies against unwanted (QT prolongation) effects.

RESULTS

In the study period there were 163 cases (155 individual ICU patients) and 117 (78%) had at least one potential DDI. Of all cases, 29 potential DDIs were found for the risk of QT prolongation in 18 (11 %) cases, where 14 of them had one and 4 had more than one (2.4%) QT prolongation DDI. The categories of these 29 clinically important DDIs among the patients' orders are; 13 (45%) 'X category', 9 (31%) 'D category' and 7 (24%) 'C category'. The most common interacting medicines in this sense were domperidone (n=9), amiodarone (n=8), quetiapine (n=7) and escitalopram (n=6) in the orders.

CONCLUSIONS

Like a systematic review and meta-analysis which revealed that DDIs are experienced by 67% of ICU patients, this study shows that a significant majority (78%) of ICU patients have the risk for DDIs in our hospital (7). Another study reports that potential DDIs occur in 54% of all ICU patients and the use of medications that may have QT prolongation is 10.7% (8). In our study we demonstrate similar findings that 11% of ICU cases are at risk for life threatening QT prolongation. The majority of relevant potential DDIs is in X category (45%) which the related medicines should not be used concomitantly. A study determines the most common QT prolongation DDIs are ondansetron, amiodarone and haloperidol in ICU patients, which we found as domperidone and amiodarone (6). A prospective observational study that evaluated of 200 ICU patients, reported 48% of patients prescribed a QT-prolonging medication and 61% of these patients experienced QT prolongation (9). Prediction of undesired complications of pharmacotherapy has a crucial role especially in critically ill patients such as ICU patients. The DDIs should be checked before administration of medicines to ICU patients and the clinicians must be adverted when multiple medications known to affect the QT interval are given concomitantly and monitoring of the ECG before and after initiation of these medications should be performed (6). Pharmacology consultation has an important role to prevent potential DDIs.

Keywords: drug interactions, intensive care unit patients, QT prolongation

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P-38 POISONS AND POISONINGS IN CINEMA

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In more than 1200 films casted from year 1900 to 2010, poisons appear either as a "leading role" or as an "auxiliary/supporting element", and number of films thematizing "poison" is highest in the period of 2000-2010 (1). The principal motive appears as revenge, and most of the poisoned victims inhabit poisoner's surroundings, some psychopathic serial killer poisoners also take part. While evildoer-characters like "Fu Manchu" cause mass-poisonings, "Poison Ivy" or "Scarecrow" in "Batman" employ poison besides other weapons. Examples include films by Alfred Hitchcock as well as others like "Hamlet", "Contergan-Just One Tablet", "Arsenic and Old Lace", and "Poisoned by Polonium".

Apparently, impressive images of poisoning played a central part in novels by (and in adaptations of) Agatha Christie, "Queen of Crime" who illustrated extensive skills on chemicals. The guidance of knowledge mostly gained during her duty in a pharmacy during World Wars I&II appears as the main motive of Agatha Christie, and choice of deadly substances was extremely careful. Characteristics of toxicant and pathophysiological consequence were matched professionally and provide typical clues to discovery of murderer, e.g. poisoned glass of champagne in "Sparkling Cyanide", arsenic in "After the Funeral", and thallium in "The Pale Horse". Toxic plants such as hemlock, yellow jasmine, and foxgloves were also of note (2).

A similar example is "Mississippi Mermaid" (France,1969) by François Truffaut, in which it turns out that the wife, played by Catherine Deneuve had been adding a rodenticide into her husband (Jean-Paul Belmondo)'s coffee (3). Some policy-shaping examples also exist as "Erin Brockovich", based on a true story, which narrates a struggle to prove the relationship between high incidence of adverse health effects and contamination of water supply with hexavalent chromium from an industrial source. Use of mushrooms in "The Beguiled" and "Phantom Thread" are recent examples. Therefore, motif of "poison" can be found throughout the history of cinematography (Table 1), and among causes of death, poisoning comprises a unique part.

Table 1. A non-redundant sample list of poison/toxic substance-related films

Poison/Toxicant	Movie/ TV episode	Director	Country, year
Aconitine	4.50 From Paddington	Martyn Friend	UK, 1987
	They Do It with Mirrors	Andy Wilson	UK, 2009
Arsenic	Arsenic and Old Lace	Frank Capra	USA, 1944
	4.50 From Paddington	Martyn Friend	UK, 1987
	The Cornish Mystery	Edward Bennett	UK, 1990
	After the Funeral	Maurice Phillips	UK, 2006
	Florence Foster Jenkins	Stephen Frears	UK, 2016
Cocaine	Peril at End House	Renny Rye	UK,1990
Coniine	Five Little Pigs	Paul Unwin	UK, 2003
Cr (VI)	Erin Brockovich	Steven Soderbergh	USA, 2000
Cyanide	Ten Little Indians	George Pollock	UK,1965
	The Adventure of the Egyptian Tomb	Peter Barber-Fleming	UK,1993
	Sparkling Cyanide	Robert Michael Lewis Tristram Powell	USA, 1983 UK, 2003
Digitalis	Appointment with Death	Michael Winner Ashley Pearce	USA, 1988 UK-USA, 2009
	Crooked House	Gilles Paquet-Brenner	UK, 2017
Environmental pollutants (esp. pesticides)	Notre Poison Quotidien / Our Daily Poison	Marie-Monique Robin	France-Belgium-Canada etc, 2011
Gelsemin	The Big Four	Peter Lydon	UK-USA, 2013
HCl	Murder in Mesopotamia	Tom Clegg	UK, 2002
Morphine	Sad Cypress	David Moore	UK, 2003
Nicotine	Three Act Tragedy	Ashley Pearce	UK-USA, 2010
Phosphorus	Dumb Witness	Edward Bennett	UK, 1996
Polonium	Poisoned by Polonium: The Litvinenko File	Andrey Nekrasov	Russia, 2007
Sedative-Hypnotics	The Mirror Crack'd	Guy Hamilton	UK, 1981
	Lord Edgware Dies	Henry Edwards Brian Farnham	UK, 1935 UK-USA, 2000
	The Murder of Roger Ackroyd	Andrew Grieve	UK-USA, 2000
	Cards on the Table	Sarah Harding	UK-USA, 2006
Strychnine	Death on the Nile	John Guillermin	UK, 1978
	The Mysterious Affair at Styles	Ross Devenish	UK, 1990
	The Million Dollar Bond Robbery	Andrew Grieve	UK,1991
Thalidomide	Contergan: Just One Tablet	Adolf Winkelmann	Germany, 2007
Thallium	The Pale Horse	Charles Beeson	UK, 1997

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