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1&18

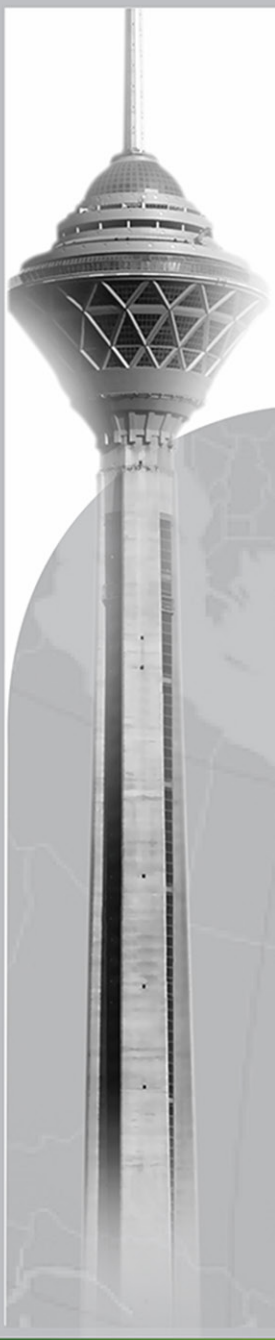
The first virtual conference & 18th National Congress on Quality Improvement in Clinical Laboratories

انجمن علمی دکترای علوم آزمایشگاهی تشخیص طبی ایران

تاسیس ۱۳۸۱

Iranian Scientific Association of Clinical Laboratory Doctors

Iranian Scientific Association of Clinical Laboratory Doctors



CONGRESS ABSTRACTS

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Message of Congress Chairman

Dr. Sh. Hemmati
DCLS

In the Name of God

Every year, Iranian Association of Clinical Laboratory Doctors (IACLD) organizes quality improvement congresses in order to improve and promote the scientific level of the country's medical laboratories. One of the outstanding differences and initiatives of this congress is delineating the topics of the congress according to the data and information on improving the quality of laboratory services elicited from national laboratories.

We are determined the conference is the best place to meet researchers and exchange cutting edge information with other experts in this field. Therefore, the active participation of researchers, experts and scientists in laboratory science will proceed the status and promote the scientific rank of the country's laboratory industry in the region and the world. We hope that with the support of all colleagues across the country, we can create a suitable and scientific platform in order to optimally improve the quality of laboratory services.

Message of Congress Secretaries

Dr. A. H. Zarnani
DCLS, PhD

Dr. A. R. Lotfikian
DCLS

Congresses on Quality Improvement in Clinical Laboratories are the most influential and most visited scientific events in laboratory sciences in the country, which bring together the lab staff and provide an ideal opportunity to exchange the latest scientific findings. Since establishment of the congress in 2002, the main goal has gyrated around the improvement in quality of services in medical diagnostic laboratories and localizing the sciences relevant to field through an organized system of continuing medical education.

It has always been a great honor and privilege to invite Iranian participants as well as colleagues from all over the world to this great scientific event for exchanging novel findings related to laboratory sciences. This congress brings together managers, staff, experts, students and researchers as well as physicians from different disciplines of medical diagnostic laboratory science to maximize mutual understanding of lab science and clinical aspects. The Congress on Quality Improvement, using the experience of university speakers as well as colleagues in country's labs, provides an opportunity for participants to benefit from the latest lab achievements.

An outstanding feature of the congress is the consolidated support of country's health experts, research institutes, research centers, universities of medical sciences, as well as companies active in the field of production of laboratory materials and equipment which strengthens our determination to sincerely invite all enthusiastic researchers in various fields of laboratory sciences to submit their latest research findings to our secretariat in order to create a platform for discussion and reciprocal exchange of findings.

We welcome the active participation of all colleagues in this event and we are impatiently waiting for your constructive feedback in holding the virtual 18th National Congress on Quality Improvement in Clinical Laboratories.

Message of Congress Executive Secretary

Dr. K. Bagheri
DCLS

The 18th National Congress on Quality Improvement in Clinical Laboratories was held virtually due to COVID-19 pandemic. The first virtual conference, which was in fact the first virtual congress held at the Ministry of Health and Medical Education, brought many experiences. Although the feedback from the participants in this conference awarded credit for our attempts by achieving an acceptable score, we acknowledge the existing shortcomings in the congress, and indeed some of them were not within the scope of our duties, namely limited capacity for participation in different topics of congress and the low score allocated for each panel. The Iranian Association of Clinical Laboratory Doctors (IACLD) is determined to conduct the 19th Congress next year in June and we hope that the existing COVID-19 restrictions will be lifted by then; otherwise, the garnered experiences from the 18th virtual conference definitely pave the way to establish the second virtual conference with better quality. In this conference, an attempt was made to address the current problems and issues of medical diagnostic laboratories from various aspects. The valuable presence of Dr. Moayed Alaviyan as the chair of the board of Medical Council of the Islamic Republic of Iran, Dr. Boroumand, the representative of laboratories staff in the Council, as well as the board members of associations of laboratory and pathology specialists at the opening ceremony of the conference, and members of the laboratory science training committee in the Ministry of Health and Medical Education, all reflect the special attention of Association's board of director to scientific and corporation related issues and problems in laboratories which can be alleviated by promoting the interaction between associations and reviewing the current managements procedures in national laboratories. Moreover, it was one of our main duties to honor the memory of our esteemed colleagues who unfortunately passed away during the past year and a half due to COVID-19 disease. In this conference, 9 lectures by prominent professors inside and outside the country were delivered in three topics about SARS-CoV-2. This disease, which is a complicated health issue and dilemma of our society today, devastated many economic and social resources of the country and should be controlled with more tactfulness. Dedicating topics to laboratory science education, quality control and risk management, and new laboratory findings show the importance of these issues from the perspective of IACLD. In conclusion, I would like to thank all the esteemed professors, dear distinguished speakers, hard-working coordinators, and those involved in holding this conference including Sama Company staff, personnel and the board of directors of IACLD. I would express my deep gratitude towards Dr. Hemmati, as both the chairman of IACLD and the 18th Congress Quality Improvement in Clinical Laboratories, and the eminent Professor, Dr. Zarnani, the scientific secretariat of the Congress, who has worked incessantly for months to hold this event. We entrust all who are dear to us to Almighty God's never-failing care.

Congress Main Topics

Coordinators of Congress Main Topics (in Alphabetic Order)

Dr. M. R. Ashrafi
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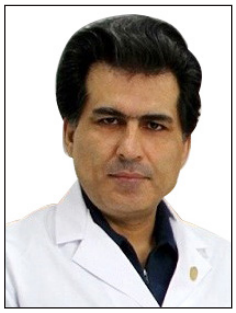

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Dr. A. Shirin
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Dr. M. Taghadosi
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Dr. A. R. Timcheh Hariri
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Dr. N. Vazifeh Shiran
PhD

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Dr. N. Vazifeh Shiran
Dr. M. Yaghmaei
Dr. S. M. R. Yasrebi
Prof. A. H. Zarnani

ABSTRACTS

The First Virtual Conference & 18th National Congress on Quality Improvement in Clinical Laboratories

Oral Presentations

Blood-Based Cancer Testing
O1 - O4

Dr. A. R. Lotfikian, DCLS

O1

Cancer Immunology and Cell- Based Markers

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Cancers are proliferation of transformed cells that immune editing has an important role for human surveillance. Cancer antigens can formed after mutations that it can included conversion of proto-oncogene to oncogene, entering of viral genes to human cells and glycoproteins, glycolipids antigens. Because, cancer antigens is similar to self-antigen, immune system is not capable to its detection. Therefore, suitable diagnostic tests and cell- based treatments has a high role in the health system. Today, the use of immune cells including DC-Based Vaccine, CART cell, CAR NK cell have important role in cancer treatment. Thus, this study introduce cell new markers as diagnostics molecules and use of modified- immune cells in cancer immunotherapy.

Keywords: Cancer, Immunotherapy, Cell

O2

Genetic Manipulation of Platelets and Trojan Horse Strategy; the Light of Hope in Decline of Cancer Metastasis

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Metastasis is the nightmare of any malignancy after discontinuation of treatment. Cancer researchers have so far been looking for a way to reduce the rate of metastasis in types of malignancies and cancer. The role of platelets in protection circulating tumor cells against cellular immune system is well known. That is why platelets in metastasis or proliferation and establishment of tumor cells in distant tissue of patients. For this reason,platelets are important in metastasis or proliferation of tumor cells in distant tissues of patients. There for any strategy of destroying platelets_CTCs interaction can be considered as an anti_metastatic approach. Genetic alteration of platelets that results in TRAIL expression can be considered as an effective anti metastatic strategy or protocol. TRAIL is a well_known cytokine that specifically induces apoptosis in tumor cells. TRAIL_expressing platelets can play a role in Trojan horse neutralizing CTCs in cancer patients and Finally, metastases should be reduced in patients.

O3

Cancer Genetic Testing in Hematologic Malignancies

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Acute myeloid leukemia (AML) results from accumulation of abnormal myeloblasts, most commonly in the bone marrow, leading to bone marrow failure and death. Genetics encompassing both classical cytogenetics and the mutational status of various genes is the most important predictor of resistance that is, failure to enter complete remission (CR) despite not incurring transplant related mortality (TRM) or relapse from remission. Much of the prognostic import of “de novo” vs “secondary” AML is subsumed by genetics thus defined. The ELN guidelines, updated in 2017, are probably the most widely-used source for assessing risk of resistance and classify patients into “favorable,” “intermediate,” and “adverse” groups based on leukemia cell cytogenetics and mutations. The single most adverse factor is a TP53 mutation, commonly associated with complex cytogenetics, but adding to the negative effect of the latter. The favorable effect of NPM1 and (bi-allelic) CEBPA mutations are considered unaffected by cytogenetic status. A FLT3 internal tandem duplication (ITD) is regarded as unfavorable only if the ratio of mutated to normal alleles (allelic ratio, AR) is >0.5. Once remission (CR or CRi) is observed physicians must decide whether to proceed to hematopoietic cell transplant. Attention has more recently turned to assessment of posttreatment persistence of a variety of mutations assessed using NGS.

Keywords: Acute Myeloid Leukemia, Cytogenetics, Mutation Status, Prognosis

O4

Prognostic Value of MammaPrint and BluePrint Ttests in Breast Cancer

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Background: Choosing the best treatment is one of the primary requirements for patient recovery, which shows its importance in breast cancer (BC). One of the main approaches to identify the best treatment is the comprehensive molecular subtyping of tumors.
Methods: The MammaPrint and BluePrint tests are designed for patients with the following characteristics: Invasive breast cancer in stages I and II; Tumor size not exceeding 5 cm; Lymph nodes involved in up to three. MammaPrint and BluePrint tests can more accurately predict the likelihood of recurrence within 10 years after diagnosis and molecular subtypes by examining 70 and 80 genes, respectively. Results: In the MammaPrint test, there is a definite report of the possibility of low risk and high risk recurrence. In the BluePrint test, patients are divided into three groups: Luminal-type, HER2-type, Basal-type.Conclusion: Each subgroup of breast cancer tumors has different degrees of invasion, long-term relapse, and response to chemotherapy. By integrating information using the MammaPrint and BluePrint tests, specialists will have more detailed information about a patient's specific options and make precise unique decisions for a patient.

Keywords: Breast Cancer, Treatment, MammaPrint Test, BluePrint Test

Challenges of Detection of Drugs and Psychotropic

O5 - O6

Dr. A. R. Timcheh Hariri, DCLS, PhD

O5

Deliberate and Unintentional Interfering Factors in the Methods of Detection of Drugs and Psychotropics in Forensic and Civil Laboratories

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Since drug trafficking is considered to be a crime of drug possession, trafficking, and drug possession based on a valid test result with restrictions, social and legal consequences for persons such as prohibition of employment, termination of employment, prohibition of work permits, family disputes. And… Therefore, people who are introduced to lab addiction testing (private, forensic, law enforcement, health, etc.) sometimes try to use methods to distort the outcome of the rejection test. It is imperative that laboratory and technical experts take careful measures to eliminate or minimize these interventional techniques and interpret the results.

O6

An Introduction on New Psychoactive Substances (NPS): Challenges for Their Laboratory Detection Kambiz Soltaninejad

Kambiz Soltaninejad 1 *

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Background: New psychoactive substances (NPS) are synthetic and new narcotic or psychotropic substances that are not controlled and registered by the United Nations drug conventions. They are as a serious public health threat. The aim of this article is review of the challenges of the NPS detection for analysis in clinical and forensic settings. Method: A literature search was performed on PubMed and Google Scholar databases. The terms used for the search were: "New psychotropic substances", “Pharmacology”, “Toxicology” and “Analysis”. The search was limited to years 2012 to March 2019. Results: More than 700 NPS have been reported in the black drug market, worldwide. Synthetic cannabinoids and cathinones are the most prevalent NPS. The continuous chemical development of NPS is the main challenge in NPS laboratory detection. Screening of target compounds and their metabolites, due to the lack of reference materials is the most important limitations in this regards. For confirmation methods, advanced techniques involving high-resolution mass spectrometry combine the detection using developed standard libraries with possible elucidation of unknown chemical structures via accurate mass. Analysis of NPS in biological samples in the clinical and postmortem toxicological setting need to sophisticated analytical instruments such as LC-MS/MS, MALDY-TOF-MS and UHPLC-HR-TOF-MS in serum, whole blood, urine, hair and tissue samples. Conclusion: Analysis of NPS is not included in the routine clinical and forensic drug screening testing. Therefore, suitable measures about information to public and health care professionals for prevention of the abuse of this type of drugs of abuse are recommended.

Keywords: New Psychoactive Substances, Analysis, Designer Drugs

Education of Medical Laboratory Sciences in Iran

O7 - O10

Dr. F. Shaygan, DCLS

O7

The Consequences of the 20-Year Discontinuation of DCLS Programmes

Fariba Shayegan *

Introduction:Since the discontinuation of the Laboratory Sciences DCLS programmes some 20 years ago, various single-subject and specialized courses in Laboratory Sciences as well as courses in Clinical Pathology have all failed to meet the requirements of our national health service;neither have they been able to resolve shortages of staff who could undertake technical responsibilities within our clinical laboratories.Discussion:At the time when graduates of DCLS programmes in Laboratory Sciences entered the clinical laboratory arena,the country's health service was suffering from significant problems such as:lack of technical staff and supervision of laboratory processes;absence of training programmes for technicians and laboratory experts alike;the public's inadequate access to laboratory services;and the poor quality of test results.DCLS graduates entering the field evidently managed to bring about many improvements in resolving the above-mentioned problems.The following are among the many services offered by DCLS:Organizing the country's largest congress of laboratory sciences titled"Quality improvement in clinical laboratory";training of competent public and private sector staff;securing easy access to laboratory services in the most remote parts of the country;installation of quality management systems in laboratories; membership of university faculties;writing 1200 applied theses;writing hundreds of articles;organizing hundreds of training and re-training courses;managing laboratory affairs institutions;over a decade of "Health Reference Laboratory"management;over two decades of membership of the nationwide Medical Council and establishing close affiliations with physicians;tens of specialists and PHDs;and active participation in major universities and laboratory centres around the world.Conclusion:The discontinuation of the DCLS programme has resulted in our health service being deprived of the great services afforded to it by this group,and setting up of parallel disciplines has only been able to provide part of the above services.

Keywords: Doctor of Clinical Laboratory Sciences (DCLS), Quality Improvment in Clinical Laboratory

O8

Clinical Diagnosis Ph.D Program

Yousef Pourkhoshbakht *

30 Years Ago Stopped the Admission of Student in DCLS Program. In the all of 17 Clinical Diagnosis Congress We Had a Special title How We Can Start Again the Old Curriculum. The Conception of our NGO policymakers based and believed on how we can alive this died horse. They Forgot the roots of problems and we watched how destroyed all of opportunities. In the edvcational hierarchy after BSC degree is M.SC and finally phD so it is logical and accepted. The DCLS curriculm stablished over 40 years ago and it isn,t reviewed anytime. We can not compare DCLS program with pharmoyr denfistry or medical, becase we have no BSC or MSS degree program in these fields. The suggertion of a new phD program which all of update edveqtional requirements is cost effective economic and compatible with today and future problems of clinical laboratories of our country. In this article we follow up step hystep stablishment of anew phD program of clinical Diagnosis.

Keywords: New Ph.D Program in CLS

O9

Lab Director Training Requirements in Iran and the World

Mir Majid Mossalaeie * 1

1- Doctor of Clinical Laboratory Sciences, (DBA)

Background: The word "A Lab Director" or "head or technical manager of the laboratory" has a meaning that in order to properly understand it, we must refer to the description of duties and responsibilities of such a person and see who in Iran and the world with what education can achieve such a position.This wide range of work and education indicates the complexity of laboratory activities, and it is necessary for all these people to be properly trained and specifically trained in laboratory sciences so that the output of the work, which is the results of laboratory tests, is accurate and have sufficient accuracy and validity because based on these results, clinical decisions are made.Method: In this article, we have tried to examine the method of training Lab Director in several prestigious universities from 5 continents.Findings: In all countries of the world, the technical managers of laboratories are of the following two general groups:1- From the group of basic medical sciences, 2- From the base of the general physician group and finally the pathology specialty.Advances in medical sciences, especially laboratory sciences, due to advances in technology and computer science in recent years have been very large and rapid. Makes it more complicated. Given the medium-term plans in the country, is our education system ready for the dramatic changes that will take place in the coming years? Discussion and Conclusion: Are our laboratories ready for Iran in 1404 or 1414 in terms of management and administration?What kind of graduates do we need to run public and private laboratories in the future? What characteristics should these people have? How will the experience of other countries, especially European and North American countries, help us?What role will the experience of the last 30 years of the country play in the future decisions of the country's education directors?Basically, how many technical managers do we need in the next 10 to 20 years?How these people should be trained so that they can train people who have the highest efficiency in the future laboratories of the country in the shortest time.

Keywords: Technical Officer, Head of Laboratory, Educational Requirements, University Training Courses, DCLS

O10

The Needs of the Health System for the Training of Lab. Director the Current and Future Situation

Mahdi Sabooni * 1

1- Reference Health Laboratory – MOH

Background: According to the regulations for the establishment and management of medical laboratories, the test must be performed under the supervision of a lab. director. The lab. director is obliged to be actively present at the laboratory during the hours stated in the legal license and to supervise other activities that are performed at other times. Methods:Non-intervention applied Research. Results: In 2020, out of 5600 active laboratories, 3844 medical laboratories have been registered in medical universities. There are currently about 3,407 qualified lab. directors:182 Clinical Laboratory Specialists, 1125 PhD in Laboratory Science, 2100 pathologists.In 2020, about 1756 laboratories did not have a qualified lab. director or did not have lab. directors license. This need is currently being met through student enrollment in the following fields: Pathology: 80 to 90 people / year, PhD in various fields: about 200 people / year, PhD in Laboratory Science: 15 to 20 people / year.With the current process, it will take at least 7 years for the health system to meet the need for lab. directors. Conclusion: With the current trend, it will take at least 7 years for the health system to meet the need for lab. director. The problem of the health system is not only the lack of lab. directors. The bigger problem is that some lab. directors are not performing their legal duties.

Keywords: Lab. Director, Medical Laboratory, Legal Duties

Ethical Issues in Laboratory Medicine

O11 - O13

Dr. M. Rasekh, PhD

O11

Sharing and Disclosing Big Data: A Moral Analysis

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Introduction: Emergence of phenomenon of biomedical big data, particularly in clinical laboratories, has created moral problems such as “informed consent”, “privacy” and “ownership”. The existence and maintaining of such data and their use should be based on moral principles. This research aims to shed light on moral problems involving biomedical big data and prevent deepening of these problems by proposing a moral analysis of them and lay theoretical and practical grounds for the formation of ethical conduct in institutes generating such data. Methodology: This research has been conducted on the basis of a moral-analytic method which is congruent with the nature of morality as a normative entity. Results: We are morally required to take seriously harms inflicted on and interests accrued to various parties to the mentioned big data. Inherent value of every individual (data subject) whose data are collected, processed and used by laboratories or biomedical centres requires that her fully informed consent is already obtained so that her privacy is not breached. Moreover, there are questions as for the entitlements of control and use of the data. The data subjects are to be considered as sharing the ownership of the data in all respects. Finally, health related interests of close relatives and related individuals are to be taken into account. Discussion and conclusion: A multi-layered interest perspective revolving around moral virtues can be of theoretical and practical help to resolve relating moral problems. Also, a balance should be struck between all the virtues involved and avoiding moral vices.

Keywords: Big Data, Disclosing, Sharing, Moral Interests, Virtues

O12

Ethical Issues in Data Mining, Considering Lab Data

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Introduction: Today in the age of information, many different data, such as laboratory data, are gathered, stored and processed; This will improve the speed, effectiveness and the quality of our decisions and on the other hand will cause some ethical challenges. Data mining is a process in which the rough data will change to information; therefore we can name it Knowledge Discovery in Databases (KDD). Methods: review study. Results: Data mining, technically, has 5 levels: extraction, transforming and loading the data; storing and managing it; providing data access or communication; analyzing or processing the data and presenting data to user. Each of these levels faces different ethical issues. Therefore, this technical process needs some philosophical rules to lead it to best decision, particularly medical decisions. Conclusion: This research, by reviewing the steps of data mining, will try to explore the ethical challenges of the issue and propose a framework that considers the ethical aspects of data mining on medical laboratory data to guarantee the appropriateness of medical decisions.

Keywords: Data Mining, Ethical Issues, Big Data

O13

Autonomy and Health Care Big data

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Background:Big data is a very large set of data that comes from a variety of sources such as online data,virtual networks and health records.This data is continuously generated in large volumes in various domains and is computer-analyzable and capable of generating new information.In the field of health, these data, which is referred to as healthcare big data,can be used to create epidemiological models and awareness of epidemics,health records and genetic databases.These data can also be used in biomedical research and the diagnosis and treatment of diseases.One of the sources of production and use of big data is the medical laboratory.Every day in various departments of medical laboratories, huge amounts of data are obtained,or new data and results are used. Using big data sets in health care can be ethically challenging. The most important big data challenges in biomedical ethics and health care include the following:1-Objectives of Big Data Use2-Data Ownership3-Privacy and Privacy4- Autonomy of Individuals 5- Risk – Benefits analysis of Using Big Data. Methods: This study aims an analytical and descriptive approach to the topic of autonomy in healthcare big data. Results:Today,autonomy of individuals in biomedical ethics has gained prominence.From a moral point of view, diagnostic,therapeutic, and research activities are carried out in accordance with the principle of respect for the autonomy of individuals.The use of big data in the health sector is no exception. It can be claimed that all the data that is used for computer or artificial intelligence analysis belongs to those whom these data have been received from. The data may be received directly or indirectly for the purpose of maintaining and improving their personal health.Although the use of this information is generally used for a benevolent purpose,it does not invite the original owners of the information to use it. Conclusion:When analyzing and using healthcare big data, it is important to consider how to obtain informed consent in order to avoid violating the privacy and autonomy of individuals. Given the diversity of ethical challenges in the use of healthcare big data,it is recommended that the Ministry of Health develop policies for the use of big data and develop a code of ethics or guidelines for the use of healthcare big data.

Keywords: Big Data, Biomedical Ethics, Autonomy

External Quality Assessments Schem (EQAP) O14 - O18

Dr. A. Shirin, DCLS

O14

External Quality Assessment in Iran and Impediments to Its Development to Proficiency Testing

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Background: Although it is not possible to draw a clear distinction between external quality assessment and proficiency testing, the educational considerations are the dominant aspect for external quality assessment programs, while the unacceptable results in proficiency testing program is accompanied by some degree of penalties. Methods This study conducted by comparing external quality assessment schemes held up in Iran and those performed according to CLIA88 and CAP recommendation, in which unacceptable results have some legal consequences. It also assesses EQAS executed yet with ISO/IEC 17043 requirements and statistical analysis of participants result according to ISO 13528. Results: In brief not covering all regions of measuring interval in executing programs, lack of regulatory criterion for acceptable variation of participants results as prerequisite for results analysis, not evaluating commutability of EQAS samples before executing programs, lack of legislation for acceptance of participants results from regulatory bodies, not providing adequate guidance and checklists for investigating source of unacceptable results, lack of any information about metrological traceability and measurement uncertainty of assigned values, and not updating permissible error specifications by regulatory bodies at logical intervals are main missing links in EQAS programs in Iran. Conclusion: Legal consequences associated with unacceptable results in proficiency testing programs makes it necessary for PT providers to observe more stringent requirements not to unfair penalize any laboratory.

Keywords: External Quality Assessment, Proficiency Testing, ISO/IEC 17043

O15

Production of Native Normal Biochemistry Control Serum for Operation of Third Party Quality Control Program in Iran Laboratories

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Background: Quality control programs are essential requirements of any clinical laboratory and Normal control (NC) human serum were made to verify the accuracy of laboratory kits, biochemical auto-analyzer. The NC human serum was formulated and scientifically analyzed for its Superiorities/ inferiorities when compared with commercial sera. Methods: The native NC made serum was prepared as per WHO recommended protocol and modified patent-based with serum from thousands of healthy donators. Panel for infectious diseases was screened for HCV, HIV and HBV pooled together and stabilized with proclin, sucrose, ethylene glycol, and Human serum albumin. Stability (short and long-term stabilities) of serums was evaluated at room temperature, 4o C and -20o C. The initial 140 values (2 vials of randomly 10 batches for seven days and one-month analysis) were used for calculation of means, SDs and CVs for twenty-eight routinely measured analytes and results were compared with those of commercially lyophilized human sera. Results: The average concentrations of twenty-eight commonly analyzed constituents were found to be near the middle of the physiological range of healthy subjects and the native NC made serum could be a suitable substitute for the commercial serum of normal range. The narrower CVs of the analytes imply a lesser batch to batch variation in the native NC. Additional advantages include high stability, high accuracy which is based on laboratory equipment, and lower cost. Conclusion: Native NC made lyophilized serum is an acceptable substitute for the commercial serum of the normal range especially in developing countries like Iran.

Keywords: Native Serum, Normal Control, External and Internal Quality Controls, Laboratory, Iran

O16

Interlaboratory (Peer Group) Program: Advantages and Challenges

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Internal quality control (IQC) and external quality assessment (EQA) are two major procedures for assurance of quality of reporting results in clinical Internal quality control (IQC) and external quality assessment (EQA) are two major approaches for assurance of quality of test results in clinical laboratories. IQC is required for daily monitoring of imprecision and bias (relative to baseline period) of measuring method and EQA is required for long-term bias (relative to other laboratories using the same method). In Iran, EQA program has three essential problems. First, is performed only three times in a year; i.e., once per four months. Second, the results of EQA are usually provided after about three months. It means that if a systematic error occurs during first month after the last EQA program, which cannot be revealed by IQC, it may need about six months to participate in the next EQA program and receive the result and recognize this error. Third, EQA program does not include all tests which are performed in the laboratories. To approach these problems, it is recommended laboratories participate in peer group or interlaboratory programs which are performed more frequently, their results are provided daily, and include all laboratory tests. However, interlaboratory program has its limitations, including providing quality control materials and matrix effects of these materials, which are discussed in the panel.

Keywords: External Quality Assessment, Interlaboratory Program, Peer-Group Program

O17

Application of External Quality Assessment Program in Calculating Measurement Uncertainty

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Each measurement, however accurate and correct, has a level of uncertainty. Describing the variability of the results of repeated measurements and identifying the contributing factors to variability can provide a useful insight into the reliability of the results and potential opportunities for improvement. The test result is only an estimate of the true value and is complete when accompanied by a statement of uncertainty. Measurement uncertainty helps to the diagnosis and pathology of the tests, suitability of tests based on clinical application and design of internal quality control system in addition to creating a sense of confidence in the measurement result. Accordingly, ISO 15189 requires laboratories to determine the uncertainty of quantitative measurement at the test stage. One approach to calculating measurement uncertainty is the top-down approach. In this approach, the laboratory can determine and evaluate the performance characteristics of its measurement system (including imprecision and Bias) using existing data such as internal quality control data, method verification data, and results from External Quality Assessment Programs (EQAPs). As imprecision is a numerical expression of precision, bias is a numerical expression of accuracy. Inevitably, any method for calculating bias has uncertainty. Therefore, correction of the measured value for this bias is added to the compound uncertainty (uc). One way to evaluate bias and calculate uncertainty of bias (ubias) is to use the results of external quality assessment programs or proficiency testing. For this purpose, each laboratory must engage in inter-laboratory comparisons at least 6 times within a reasonable timeframe.

Keywords: External Quality Assessment Programs, Uncertainty, Bias, Imprecision, ISO 15189

O18

External Quality Assurance System(EQAS), Proficiency Testing (PT) and Peer Group Program(PGP) in Laboratories in Developed Countries

Seyed Mohammadreza Fooladi *

EQAS and PT have the main goal of assessing the competency of labs, education and evaluating labs' commitment to quality improvement programs designed for laboratories in the field of reportable tests. In North America, labs take part in different proficiency tests that are under the control of CLIA 88(Clinical Laboratory Improvement Amendments) rules. In this study we both consider general rules of CLIA in relation to proficiency testing, and also explain two methods of assessment which are used by AAB(American Association of Bioanalysts) and CAP(Clinical American Pathologists). CLIA 88 rules are approved for medical diagnostic labs which test blood, body fluids and human tissues. Laboratories are mandated to work on sent samples in their regular work cycles, and use the exact same methods that they use for patients' samples. Methods of testing and the number of times the tests are performed on samples should be exactly the same as those for lab patients. Exchange of information and consultation between lab workers and their access to information for reporting the results are strongly prohibited. In this study proficiency testing for labs which are under control of CAP and AAB and work under CLIA 88 rules is reviewed in detail and examples of sent reports and test materials are explained. Acceptable criteria for different tests are also presented.

Immunopathogenesis of SARS-COV2 O19 - O20

Dr. M. Taghadosi, MD

O19

Advanced Glycation End Products (AGEs) and Its Receptor, RAGE, Modulate Age-Dependent COVID-19 Morbidity and Mortality. a Review and Hypothesis

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Coronavirus Disease 2019 (COVID-19), caused by the novel virus SARS-CoV-2, is often more severe in older adults. Besides age, other underlying conditions such as obesity, diabetes, high blood pressure, and malignancies, which are also associated with aging, have been considered risk factors for COVID-19 mortality. A rapidly expanding body of evidence has brought up various scenarios for these observations and hyperinflammatory reactions associated with COVID-19 pathogenesis. Advanced glycation end products (AGEs) generated upon glycation of proteins, DNA, or lipids play a crucial role in the pathogenesis of age-related diseases and all of the above-mentioned COVID-19 risk factors. Interestingly, the receptor for AGEs (RAGE) is mainly expressed by type2 epithelial cells in the alveolar sac, which has a critical role in SARS-CoV-2-associated hyper inflammation and lung injury. Here we discuss our hypothesis that AGEs, through their interaction with RAGE amongst other molecules, modulates COVID-19 pathogenesis and related comorbidities, especially in the elderly.

Keywords: COVID-19, Diabetes, AGE, RAGE, Aging

O20

SARS-COV-2 Variants: Immune Escape and Vaccine Efficacy

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Unlike most RNA viruses, coronaviruses have a novel exoribonuclease (ExoN). It can correct many of the errors that occur during replication. The frequency of SARS-CoV-2 mutation is 1-2 single-nucleotide mutations in its genome per month. Also, according to the recent finding SARS-CoV-2 has no genome integration into the DNA of infected cells. There are mechanisms that virus can suppresses the translation of host mRNA. For instance, Nsp1 can induce the cleavage of host mRNA and block translation of host mRNA. One of the immune escape mechanisms of SARS-CoV-2 is formation of viral syncytia. Syncytia (fused cell structures) are induced by viral infections such as HIV, HTLV-1, HSV and SARS-CoV-2, but not by the SARS-CoV-1. Forming syncytia allows infected cells to thrive for long periods of time, churning out more and more virions. Some COVID-19-infected cells even form syncytia with lymphocytes for immune escape. According to WHO classification, variants of concern (VOC) and variants of interest (VOI) are major variants of SARS-CoV-2. The most mutations are substitution, addition or deletion. First reported SARS-CoV-2 mutation is D614G that is common to nearly all sequenced SARS-CoV-2 genomes worldwide. VOC have mutation in different part of genome that can lead to antigenic properties of N-terminal domains, receptor-binding domains, and S2 domains. Delta is one of the most important VOC and has 3 RBD mutations. The first, a lysine to asparagine substitution at position 417, is present in some, but not all sequences of B.1.617.2. It is also common to the Beta variant and has been associated with conformational changes to S protein, which may aid in immune escape. The second mutation, a leucine to arginine substitution at position 452, is common to the former variant of interest Epsilon, and is known to increase affinity for ACE2 receptors found on the surface of a variety of human cells, including the lungs. And the third, a threonine to lysine substitution at position 478, is common to the B.1.1.519 lineage, and has been predicted to increase electrostatic potential and steric hindrance, which may further increase RBD/ACE2 binding affinity and enable immune escape. The furin cleavage site is the junction where that cleavage takes place, and Delta contains a proline to arginine substitution (also common to Alpha) near this cleavage site at position 681 that makes the sequence less acidic and causes furin to recognize and cut more effectively. The mutation likely increases viral infectivity and transmissibility; however, it must occur on the background of additional spike protein mutations in order to be consequential. Delta contains a number of mutations that fall within an antigenic supersite, including a threonine to arginine substitution at position 19, a glycine to aspartate substitution at position 142, deletions at positions 156 and 157 and an arginine to glycine substitution at position 158. Accumulated mutations in antigenic supersites are thought to enhance the virus's ability to avoid immune detection. According to recent findings, Sera from individuals who had received one dose of the Pfizer or the AstraZeneca vaccine had a barely discernible inhibitory effect on the Delta variant. Administration of two doses of the vaccine generated a neutralizing response in 95% of individuals, with titres three - to fivefold lower against the Delta variant than against the Alpha variant. The spread of the Delta variant is associated with an escape from antibodies that target non-RBD and RBD epitopes of the spike protein. Finally, Effectiveness of BNT162b2 or ChAdOx1 vaccines after one dose against delta variants is 30.7%. However, Effectiveness of BNT162b2 or ChAdOx1 vaccines after two doses against delta variants are 88% and 67%, respectively. In conclusion, vaccine is the most effective approach in control of SARS-CoV-2 variants.

Laboratory Diagnosis Methods of SARS-COV2 Infections O21 - O22

Dr. S. M. Boutorabi, DCLS, PhD

O21

Serological Tests Based on Antibody and Antigen Detection in Covid 19 Infection

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Infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) initiates a humoral immune response that produces antibodies against specific viral antigens such as the nucleocapsid (N) protein and spike (S) protein, which include specific anti-S protein antibodies that target the spike's S1 protein subunit and receptor binding domains (RBD). Serologic tests can detect the presence of these antibodies in serum within days to weeks following acute infection. However, serologic testing should not be used to diagnose acute SARS-CoV-2 infection. Serologic tests can identify persons with resolving or past SARS-CoV-2 infection and thereby help scientists and public health experts better understand the epidemiology of SARS-CoV-2 individuals and populations at higher risk of infection. Although the immune correlates of protection are not fully understood, evidence indicates that antibody development following infection likely confers some degree of immunity from subsequent infection for at least 6 months. However, it is not known to what extent emerging viral variants may impact immunity from subsequent infection.

Vaccine induced antibody development has implications for serologic testing. Before vaccine introduction, a SARS-CoV-2 serologic test that detects any of the N, S or RBD antibodies could be considered to indicate previous exposure to SARS-CoV-2. With the introduction of vaccine, vaccinated persons may test positive by serologic tests for the vaccine antigenic target (S and S subunits, including RBD) but not against other non-target proteins. Thus, history of vaccination and/or prior SARS-CoV-2 infection must be considered when interpreting serologic test results.

Different types of assays can be used to determine different aspects of the adaptive immune response and functionality of antibodies. The tests can be broadly classified to detect either binding or neutralizing antibodies.

O22

Immune Response in Covid 19 Disease and Vaccination

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Today, a major public health issue is the emergence of a novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which is responsible for ongoing the global pandemic of coronavirus disease 2019 (COVID-19). Currently, our knowledge is completing on the host immune responses to SARS-CoV-2, and reported data revealed that SARS-CoV-2 causes robust inflammatory responses which are implicated in damage to the airways, highlighting the critical role of immune responses in immunopathogenesis and clinical outcomes in COVID-19 patients. Pro-inflammatory profile induced by SARS-CoV-2 may be an aggravating factor for COVID-19 immunopathogenesis. A better understanding of the immune system dysfunctions is a key step for propelling progress toward the application of appropriate diagnosis as well as immunomodulatory treatments. In this presentation I will talk about COVID-19 clinical manifestations, organization of the immune system in the lungs, immune response against SARS-CoV-2 in innate and acquired immune responses, humoral response profiles, and then I will continue talking on immune response to vaccine, current vaccine platforms, efficacies and immunological findings on the vaccines.

New Developments and Challenges in Laboratory Diagnosis of Cardiac and Renal Diseases

O23 - O25

Dr. Sh. Hemmati, DCLS

O23

New Findings of Cardiac Markers

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Acute coronary syndrome (ACS) and heart failure (HF) are relaive common life-threatening disorders. Pathophysiologic process of ACS and HF is initiated by atherosclerosis which results in cell death and then myocardial dysfunction. By far, numerous biomarkers have been studied and evaluated as biomarkers of ACS and HF, among which are B-type natriuretic peptide (BNP) and N-terminal proBNP (NT-proBNP). Both BNP and NT-proBNP are being used for diagnosis of HF, assess severity of HF, and establishing risk of HF and ACS. BNP and NT-proBNP are determined by a number of different immunoassays using antibodies directed to different epitopes located on the antigen molecules. Analytical characteristics of commercial BNP and NT-proBNP assays vary between by different manufacturers. On the other hand, results of these assays are affected by preanalytical variables, including post-translaional modificaions and biological variaions. So, in order to use BNP and NT-proBN as diagnosic and prognosic biomarkers, it is needed to better understand or better establish pre-analytical variables and analytical characteristics. Copepin has been suggested as another cardiac biomarker which is the C-termial of provasopressin and produces by cleavage of pre-pro-arginine vasopressin (pre-proAVP) in the neurohyopophysis. This glycosylated 39-amino- acid peptide is released along with AVP into the circulation and has a longer half-life than AVP, making its measrement much easeasr. Because AVP is a stress hormone, copeptin has been assayed as a marker to define hemodynamic stress in acute myocardial infarction (AMI) and HF.

Keywords: BNP, NT-proBNP, Acute Coronary Syndrome, Heart Failure, Copeptin

O24

Measurement Problems of Troponin and Creatine Kinase-MB in Diagnosis of Acute Coronary Syndrome (ACS)

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Background: Measuring cardiac markers has revolutionized the diagnosis of heart diseases. The sensitivity and specificity of these tests in the diagnosis of non-ST-segment elevation myocardial infarction (NSTEMI) necessitate their use in the evaluation of acute coronary syndrome (ACS). Method: Followins data is presented based on literature review and my own experiences during the part couple of years. Results: According to the most recent global definition, the term MI (Myocardial infarction) should be used if there is evidence of myocardial necrosis and myocardial ischemia occurrence. Detection of increases or decreases in cardiac biomarkers with at least one value above the 99th percentile of upper limit of reference (URL) is the primary criterion for indicating myocardial ischemia. The increase of cardiac biomarkers such as cardiac troponins (CTNS) and creatine kinase-MB is not necessarily due to MI as they can be observed in other types of heart diseases such as sepsis, arrhythmia, renal failure, hypothyroidism and many more. The false negative result of a cardiac biomarker in patients with myocardial infarction causes their disease to be undiagnosed, making patients deprived of treatment. On the other hand, false positive results lead to misdiagnosis, misinterpretation, unnecessary actions and increased cost of treatment for the disease. Conclusion: These false positive or negative results may be due to errors before or during the analysis. In this panel, in addition to describing pre-analytical errors in the two common tests of troponin and creatine kinase-MB, we explain the causes of analytical errors besides the appropriate methods to identify and manipulate them.

Keywords: Cardiac Troponin, Creatine Kinase-MB, Myocardial Infarction

O25

Evaluation of Novel Renal Biomarkers with Emphasis on NGAL in Acute Renal Injury

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Biomarkers of kidney disease are substances that identify damage to the renal tract and may reflect renal function. They may be released from the kidney or result from a specific response to damage to the renal tract or changes in renal function. Serum creatinine is currently the most commonly used marker of renal function in routine clinical practice. It is used to estimate the glomerular filtration rate (GFR), but is unfortunately an unreliable indicator of kidney function, for many reasons. For example, serum creatinine is affected by several nonrenal factors such as age, gender, muscle mass, and hydration .In acute kidney injury (AKI), serum creatinine does not reflect the actual decrease in the GFR and takes several hours or days to reach a new steady state. In fact, serum creatinine may not increase until over half of the patient's renal function is lost. In recent years several potentially relevant novel biomarkers of kidney disease have been discovered through omic technologies. These novel biomarkers could be used to predict the risk of kidney disease, diagnose renal disease after an acute event, suggest the likely outcome (prognosis) in the absence of treatment, and predict the likely response to treatment. In this study,we review the new renal biomarkers and in particular the NGAL biomarker and its diagnostic value in acute kidney injury (AKL).(termed as Renal Troponin !).

Keywords: Renal Biomarkers, NGAL, AKI

New Developments in Immunohematology O26 - O29

Dr. A. Gharehbaghian, DCLS, PhD

O26

Blood Transfusion Strategy in ABO Mismatch Allogenic Hematopoietic Stem Cell Transplantation

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Allogeneic hematopoietic stem cell transplantation is a curative option for a variety of malignant and non-malignant hematological and congenital diseases. Due to the fact that HLA system is inherited independently of the blood group system, approximately 40–50% of all HSCTs are performed across the ABO blood group barrier. The expected immune-hematological consequences after transplantation of an ABO-mismatched stem cell graft are mainly due to presence of isohemagglutinins or passenger lymphocyte syndrome. Dependent on the kind of ABO mismatch, different effects on engraftment have been observed, e.g. delayed red blood cell recovery and pure red cell aplasia. Data on incidence of acute graft-versus-host disease, non-relapse mortality, relapse, and overall survival are inconsistent. However, knowledge of clinician about expectable complications and close monitoring of patients helps to detect problems early and to treat patients efficiently; advanced immunohematology laboratory have a key role in both prevention and management of these cited complication. The risks of these complications can be prevented by graft manipulation, typing of ABO/Rh group by molecular techniques, HLA typing, donor antibody screening by flowcytometry, lineage specific chimerism assay by sequencing. Appropriate transfusion support according to the type of ABO incompatibility particularly for platelet by immunohematology service via flowcytometry cross match help to prevent platelet refractoriness and management of bleeding risks. An advanced immunohematology laboratory besides in hematopoietic stem transplantation center not only help to prevent and also management of life threatening complication after transplantation but also leads to blood management in transfusion service and eventually aid to health economics.

Keywords: Transfusion, ABO Mismatch, Hematopoietic Stem Cell Transplantation

O27

Investigating Fetal Anemia Due to Low-Prevalence Sc4 Antigen

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Background: Hemolytic disease of the fetus and new born (HDFN) happens when fetal cells enter maternal circulation, stimulating an antibody response in the mother. As the level of maternal antibody rises, fetal anemia progresses. Most antibodies observed are directed against D,K,c,E,Fya,Jka,s and high and low prevalence antigens. In this case we investigated a prenatal blood sample from a woman in her 29 week of pregnancy. The fetus's ultrasound result showed suspected fetal anemia3.0g/dl. Anti-Rd was identified against the low-prevalence Sc4 antigen in Scianna blood group system. Alloantibodies to Scianna antigens are rare and none have been reported to cause a severe hemolytic transfusion reaction (HTR) only mild HDFN has been reported. Method: Maternal antibody formation was determined by serologic studies, flow cytometry techniques, DNA molecular techniques. Results: The mother's blood group was B RhD positive. Antibody Screening test results were negative. Further evaluation was done on a cord (PUBS) sample. The fetus's blood group was B RhD positive. Results of the direct anti-globulin tests (DAT) were positive. An eluate against panel of rare low prevalence Selected cells demonstrated the presence of rare anti-Rd which accounted for the positive DAT results and cause of fetal anemia. Conclusion: In case of fetal anemia, the DAT should be included in the diagnostic work up.

Keywords: HDFN, Alloantibody, Scianna Blood Group

O28

Platelet Refractoriness

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Platelet refractoriness refers to a lack of adequate post-transfusion platelet count increment and associated with a number of adverse outcomes including longer hospital stays, higher inpatient hospital costs, inferior survival and more bleeding, including fatal bleeding. Platelet refractoriness can represent a significant clinical problem that complicates the provision of platelet transfusions, although it is most frequently due to non-immune platelet consumption, immunological factors are also often involved. In the circulation, platelets harbor the greatest amount of circulating MHC class I molecules. Specific HPA antibodies occur at a frequency of 8% to 20–25% in various studies of multi-transfused hematology patients and are usually found in combination with HLA antibodies. Most commonly, HPA alloimmunization is directed toward antigens with phenotypic frequencies below 30%. Some studies have suggested that there is no clear correlation between HPA antibodies and poor responses to platelet transfusions but others have found that matching for platelet-specific antigens in patients refractory to HLA-selected platelets may be beneficial. Methods for platelet cross matching include solid-phase red cell adherence, modified antigen capture ELISA and flow cytometry, which detect antibodies against the antigens in an individual platelet component. When platelets are transfused into an allogeneic recipient the host is thus exposed to a huge dose of potentially altered donor MHC class I molecules. Published reports have cited an incidence of refractoriness to platelet transfusion of 15 to 25 percent in the hematology/oncology patient population utilizing leukocyte-reduced blood products and even higher rates during the pre-leukocyte-reduction.

Keywords: Platelet, Platelet Refractoriness, HPA Alloimmunization

O29

Allo-Antibodies of Unknown Specificity and Their Roll in Immunohaematology Lab

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The main purpose of RBCs transfusion is to raise a proper hemoglobin level and absence of any adverse reactions as a successful transfusion outcome. Detection of broad range clinically significant unexpected an antibody against an antigen that patient lacks, is called allo-antibody screening and detection of unexpected an antibody to an antigen that he/she possess, is called auto-antibody screening. The most important overall purpose of pre-transfusion compatibility testing is to prevent hemolytic transfusion reaction, technically and clerically against blood components. Clinically significant Allo/auto antibodies are associated with hemolytic transfusion reactions, hemolytic disease of the fetus/newborn, notable decrease in the survival of transfused RBCs and spontaneous miscarriage. When a positive result is obtained in the Ab-screening but the Ab specifies cannot be determined, the Ab is named Allo-Antibodies of Unknown Specificity (AUS). It is almost impossible to define if the referred AUS is a hemolytic antibody or just an artifact reaction. In other hand, AUS can be insignificant or potentially cause post-transfusion hemolysis. Information about the prevalence of clinically relevant AUS is still lacked and it is one of the most common groups of antibodies identified in Immunohematology Reference Lab. However, approximately 15-30% of those antibodies evolve to clinically relevant Abs and indirect anti-globulin (IA) cross-match must be performed before each transfusion to recipients with AUS in order to avoid hemolytic reaction. In this manner the methods to predict the potential or significance clinical relevance of AUS such as the Monocyte Monolayer Assay (MMA), Chemiluminesence, Chromium Survival or Flocytometery are used.

Keywords: Blood Transfusion, Allo-antibody Screening, Allo-Antibodies of Unknown Specificity

New Trends in the Diagnosis of Inborn Errors Metabolic O30 - O31

Dr. M. R. Ashrafi, MD

O30

Importance of MS/MS and NGS Technology in Inherited Metabolic Disease Diagnosis

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Different metabolic disease diagnosis is comprised in newborn screening (NBS) programs in several countries. These diseases include disorders of amino acids and fatty acids oxidation. Reduction of morbidity and mortality, early detection and treatment are advantages of NBS program. Issues and difficulties related to NBS program include parental concerns (false positive), false negative, unexpected and unpredictable result, labeling patient's without specific symptoms. MS/MS is one of the most powerful techniques in detection of inherited metabolic diseases compared to traditional instruments first used in 1990. MS/MS technique is very important in early detection of metabolic and genetic diseases. By incorporation of this technique, more than 40 metabolic and genetic diseases are detected in less than 2 minutes through dried blood spot (DBS). Top speed and high accuracy make this technique widely used in NBS program in different countries such as Iran. Applications of genetic testing at birth and diagnosis of metabolic disorders in screening for inherited metabolic disorders in neonates, using LC-MS / MS, GC-MS and NGS in postnatal health care, can effectively help community's health and economics. The incorporation of next generation sequencing (NGS) technologies can obtain molecular sequence of the desired genes in metabolic diseases. Despite accurate description of metabolic patient's clinical, biochemical and pathological patterns for finding genetical findings is dramatically valuable, NGS technology can be one step forward in diagnosing issues. Diagnostic panels for hereditary metabolic diseases will help us to identify similar phenotypic ambiguities via point-by-point reading of the genes involved in these diseases. This will illustrate the importance and position of NGS in the diagnosis of hereditary metabolic diseases.

Keywords: Inherited Metabolic Diseases Screening, MS/MS, Diagnose, NGS

O31

Introduction to Classification of Inborn Errors of Metabolism and Role of Biochemical and Genetic Analysis in their Diagnosis

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Sir Archibald Edward Garrod (25 November 1857 – 28 March 1936) introduced the concept of Inborn Errors of Metabolism (IEM) at the turn of the 20th century (1908) in Royal College of Physicians of London. More than 1000 genetic defects related to IEM have been identified. IEM affect only approximately 1 in 5000 live births and while they are individually rare, they collectively account for a significant proportion of disorders, particularly in children. They present clinically in a wide variety of ways, involving virtually any organs of the body. The brain at birth is the most immature organ of the body and therefore the nervous system is more often the target of hereditary IEM than any other organ system. In IEM the defective gene is normally expressed in one or more organs, not necessarily in the nervous system and chemical analysis of tissues are frequently diagnostic. In Neurodegenerative disorders the defective gene is mainly or exclusively expressed in the nervous system and lack characteristic chemical abnormalities of tissues or body fluids. Most of the neurodegenerative disorders have no biochemical explanation. Neurometaboloic disorders can be classified as: Anatomic Location (Gray matter/ White matter) Symptoms (Intoxication/ Energy deficiency), Metabolites (Small molécule/ Large molécule) and Neurologic Manifestations (Acute Encephalopathy / Chronic Encephalopathy) Acute Encephalopathies: Presents early in life, usually shortly after birth or during early infancy, with Symptoms of lethargy, poor feeding, recurrent vomiting, seizure, change in tone and coma. Usually caused by small molecule diseases, initially affects gray matter and represents as intoxication. Chronic Encephalopathies: Presents in late infancy, childhood and adolescence with gradual onset of long tract signs such as spasticity or ataxia. Usually caused by large molecule or storage disease, initially affects white matter and represents as either intoxication, energy deficiency or both. Acute and chronic encephalopathy are among the common neurologic presentations of IEMs. A detailed History remains the most important basis for suspecting IEMs. A positive Family History is also helpful, especially if the symptoms coincide with those now presenting. Once one is considering a diagnosis of NM disorders the next step is to carry out readily available Laboratory Studies to confirm this suspicion. Because the clinician is seldom able to ascertain initially a specific diagnosis, these laboratory tests help us to Screen for several disorders. In detection of neurometabolic disorders in the older children, routine metabolic screening tests in urine and blood are seldom helpful and therefore enzyme and genetic analysis will be needed for diagnosis. New genetic analysis tests including NGS are a powerful diagnostic aids.

Keywords: IEM, Neurodegenerative Disorders, Acute Encephalopathy, Chronic Encephalopathy, NGS

Non-Communicable Diseases (Autoimmune Diseases and Diabetes) O32 - O35

Dr. N. Kianmehr, MD

O32

Manegment of Diabetes on the Basis of Laboratory Data

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Diabetes is diagnosed on the basis of hyperglycemia and there are fewer diseases in the body that make laboratory information more important and effective than clinical presentation in decision making. Fasting blood glucose is more than 126 mg / dl and hemoglobin A1C greater than 6.5 indicates diabetes., Level of Fasting blood glucose and hemoglobin A1C determine the Status of patient control and efficacy of the medication. Measuring other variables such as blood lipids, renal, liver and thyroid function is important for the optimal manegment of patients with diabetes. In this regard, the good and scientific relationship between clinical and labratoury centers is very important.

Keywords: Diabetes, Laboratory Diagnosis, Hemoglobin A1C

O33

Dignosis of Common Connective Tissue Disorders

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Autoimmune disorder occurs as a result of immune system malfunctions and auto autoantibody production when it mistakenly attacks healthy organs. Auto antibodies have been used most often to confirm diagnosis. however, regarding heterogeneity of clinical presentations, some times the diagnosis is chalenging. Antibodies can be detected in normal adults and many years before presentation of any clinical features. More over, the same autoantibody can be found in multiple diseases (eg, systemic lupus erythematosus [SLE], rheumatoid arthritis [RA]). The diagnosis is mainly based upon the detection of specific antibodies in the setting of relevant clinical manifestation, after excluding alternative diagnosis.

Keywords: Autoimmune Disease, SLE, RA, Laboratory Diagnosis ,Auto Antibody

O34

Laboratory Tests of Autoimmune Diseases; Systemic Lupus Erythematosus (SLE) and Rheumatoid Arthritis (RA); the Past and the Present and the Challenges Ahead

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Background: Changing the lifestyle of people in advanced and developing societies has led to a variation in the pattern of disease and its diversification result in the prevalence of infectious diseases has replaced by malignancies and autoimmune diseases. Systemic Lupus Erythematosus (SLE) and Rheumatoid Arthritis (RA) are the most common autoimmune diseases in the world and in Iran. Methods: Early detection of autoimmune diseases, especially in SLE and RA has an important role in controlling and reducing the complications of the disease. Results: In this regard, in vitro detection of autoantibodies using high specificity and sensitivity methods can be valuable. The emergence of a variety of immunoassay methods based on labels conjugated to antibodies such as EIA, IFA, CLIA, ECL, and ELFA is one of the most prominent developments in the field of autoantibody assay. Although the breadth of immunoassay methods has made many choices for laboratories in the field of measurement, due to the different sensitivity and specificity of their proposed methods, it can lead to challenging interpretations for diagnosis. Discussion and Conclusion: Due to the high penetration rate of technology and automation in the field of laboratory, introducing novel methods with high sensitivity and specificity in immunoassay detection, which increasingly reduce the role of operators in diagnosing and interpreting the test results.

Keywords: Autoimmune Disease, SLE, RA, Immunoassay, Laboratory Diagnosis

O35

Clinical Features of Common Connective Tissue Disorders

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Autoimmune disease are conditions resulting from an abnormal immune response to a normal body part. More than 80 types of autoimmune diseases have been identified Their exact etialogy are unknown. Generally presene of self-reactive immune response (auto-antibodies, self-reactive T cells) cause injury to different organs of the body. This may be restricted to certain parts (e.g in autoimmune hepatitis) or cause multiple organ involvement (e.g. in systemic lupus erythematosus). Most of autoimmune diseases are common in women than men. Increased understanding of pathophysiology of autoimmune diseases resulted advances in development of new therapeutic medications that more specifically target important mediators. These treat to target modalities causes better outcome for autoimmune conditions.

Keywords: Autoimmune Disease, SLE, Auto Antibody

Plts and Thrombosis

O36 - O41

Dr. N. Vazefeh Shiran, PhD

O36

Standardization of Prothrombin Time / International Normalized Ratio in Iran

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Prothrombin time (PT) is one of the most commonly used tests in clinical laboratories, with a significant result reporting variation. It is converted to international normalized ratio (INR) to overcome this variation, but automation results in new challenges, including the type of instrument used and the value of the geometric mean normal PT (GMNPT). Manufacturers have made some efforts to improve PT/INR standardization, tailoring reagents to specific coagulometers. The reagents may designate two types of the international sensitivity index (ISIs), the general and the reagent/coagulometer-specific ISI. Although specific ISI has a significant role in improving INR standardization, values reported by two laboratories may differ even with the same thromboplastin reagent and coagulometer. Laboratory ISI verification and validation can reduce the source of errors and improve standardization of INR. Specific ISI should be verified prior to clinical use in all laboratories using the reagent / coagulometer-specific ISI. All laboratories using a generic or general ISI, verification is required and laboratory calibration is strongly recommended. Verification and if necessary, calibration of generic or general ISI and reagent/coagulometer-specific ISI, prior to clinical use is mandatory, and play an important role in improving PT/INR results.

Keywords: Prothrombin Time, International Normalized Ratio, Geometric Mean Normal Prothrombin Time, General ISI, Reagent/Coagulometer-Specific IS

O37

The Role of Platelets in Atherosclerosis Development

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Atherosclerosis is a common heart disease that is considered as a major risk factor of coronary artery disease (CAD) and could impose a high level of mortality in the world. There are different factors involved in atherosclerosis development. Platelet is one of the risk factors of the atherosclerotic state through the foam cell. Platelets are important players in atherosclerosis and recruit other cells towards lesion sites. Multitude biomarkers are currently available that detection platelet function, prognosis or risk stratification of CAD and monitoring after anti platelet therapy.

O38

Molecular Diagnosis of Thrombotic Disorders

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Different pathways of homeostasis with many factors such as coagulation proteins (fibrinogen, thrombin etc) and anticoagulants (protein C, S etc) cause to stop bleeding when the vessels are damaged and prevent the formation of abnormal clots that can cause the occlusion of the arteries.Thrombophilia is the tendency of body for creation of clot in the vessels due to disruption of homeostasis pathways. Venous thromboembolism (VTE) mainly occurs as two different and important forms: deep vein thrombosis (DVT) and its complication, pulmonary embolism that is also life-threatening. There are many inherited and acquired factors for occurrence of VTE. The most important hereditary factors are protein C, S and Antithrombin (AT) deficiency, Prothrombin G20210A and Factor V Leiden (FVL). Thrombophilic panel is performed for people with specific clinical conditions that they are high risk for these factors to be aware of the recurrence of thrombosis and the risk of thrombosis in their relatives. Among the important risk factors in recurrent miscarriage are FVL (G1691A) and Prothrombin G20210A mutations. FVL causes more than 90% of cases of Protein C Resistance (APCR). Diagnosis of these factors effects on the prophylaxis and treatment of patients. Prothrombin G20210A and Factor V Leiden are candidates for genetic testing. Nowadays, there are many techniques for studying the different alleles and variants of a gene such as Real-Time PCR, RFLP-PCR, Allele specific-PCR (AS-PCR) etc. Choosing the appropriate technique and correct interpreting the results is very important.

Keywords: Thrombosis, Coagulation, Molecular Diagnosis

O39

Laboratory Evaluation of the Antiphospholipid Syndrome

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APS is a complex disease that affects specialists in cardiology, hematology, rheumatology, Gynecology, neurology, psychology, and dermatology. In this disease, autoantibodies to phospholipid or phospholipid-dependent proteins of the IgG, IgA, and IgM classes are produced. The disease was first described in 1983 by English rheumatologist Dr. Graham R.V Hughes. The antibody is an antiphospholipid (P-Serin>P-Ethanolamin and P-Inosithol) or a phospholipid-binding protein that can be used in 92% of cases against β2GPI, prothrombin and annxin A5 and in 10% of cases against Thrombin, AT-III, t-PA, factors X, XI and XII, complement protein C4, Pro-S, Pro-C, etc. In this disease, on the one hand, in vitro coagulation tests are prolonged and on the other hand, the patient has a tendency to thrombosis despite having thrombocytopenia in vivo. According to Saporo and Sydney criteria, one of the two main clinical findings of the disease should be thrombosis or miscarriage and sometimes sub-symptoms of preeclampsia, neurological symptoms or skin symptoms, and at the same time, one of the two immunoassays (ELISA for Anti-cardiolipin, B2-GPI, prothrombin, anxin, etc.) or coagulation test (PTT-LA, d-RVVT, T: E-CT in three forms: screen, confirmation and S:C ratio) twice and in 12 weeks interval to be approved. In this article, the standard criteria for assessing APS disease in two immunology and hematology laboratories will be discussed.

O40

Laboratory Evaluation of Thrombosis

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Venous thromboembolic disease (VTE) is a significant source of morbidity and mortality in patients. The annual incidence of this disorder is 104 to 183 per 100,000 populations in Europe, higher in African Americans, and lower in Asians. There is no available biomarker capable of diagnosis or exclude VTE in all patients.
Moreover, History and physical exams alone are not confident to exclude the diagnosis of thrombosis. The most widely used diagnostic test for thrombosis is D-Dimer with high sensitivity (90%) and low specificity (near 55%). In addition to D-dimer, the most promising novel biomarkers for venous thrombosis is soluble (s) P-selectin. P-selectin is a cell adhesion molecule stored in a-granules of platelets and in Weibel–Palade bodies of endothelial cells and involved in platelet and leukocyte adhesion. The level of this molecule may depend on the extent of thrombosis. sP-selectin levels are effective in the ruling–in the diagnosis of deep vein thrombosis (DVT) (high positive predictive values (PPVs). in contrast, D-dimer measurements proved more effective than sP-selectin in excluding the diagnosis of DVT (high negative predictive values. Therefore, for precise diagnosis of thrombosis, the measurement of s P selectin it is highly suggested.

Keywords: Thrombosis, D-Dimer, sP-selectin

O41

Laboratory Evaluation of Heparin Induced Thrombocytopenia Thrombosis (HITT) Syndrome

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Introduction: Heparin induced thrombocytopenia (HITT) is drug-induced immune complication caused by anti-PF4-heparin complex. Despite thrombocytopenia, bleeding is rare; rather, HIT is strongly associated with thrombosis. A commonly used score to predict the likelihood of HIT is the "4Ts" score (thrombocytopenia, timing, thrombosis and other causes of Thrombocytopenia). If the score is 0–3, HIT is unlikely. Scores of 4–5 and 6–8 indicate intermediate probability and highly likelihood of HIT. Diagnosis for HIT involves both clinical evaluation and, if indicated, laboratory testing for confirmation or exclusion, typically using an initial immunological assay (“screening”), and only if positive, a secondary confirmatory functional assay. The most common immunological assays include ELISA, chemiluminescence, lateral flow, latex based assays and particle gel techniques (PaGIA). The most common functional assays comprise serotonin release assay (SRA), heparin-induced platelet activation (HIPA); flow cytometry and light transmission aggregometry (LTA). These assays differ in terms of relative sensitivity and specificity for pathological HIT, as well as false negative and false positive results. It is recommended that sample collection (serum or plasma) be performed in the acute phase of HIT, before antibodies disappear. Conclusion: In cases where a strong clinical probability is accompanied by positive results in both functional and immunological assays, the diagnosis of HIT can be made without doubt. Otherwise, variable sensitivity and specificity of laboratory assays in combination with a questionable probability of the clinical diagnosis of HIT may generate situations in which a final statement about the presence or absence of HIT is not possible.

Keywords: HITT, Heparin, Laboratory Diagnosis

POCT

O42 - O44

Dr. Gh. R. Hamzehlou, DCLS

O42

Point of Care Testing (POCT)

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For many years, all or the majority of laboratory testing was performed in a medical laboratory. This was necessary due to the complexity of the testing. With computer chip technology, testing has emerged from the laboratory to the patient's bedside, the pharmacy, the physician's office, the patient's home and other non-laboratory sites. This testing is called point-of-care testing and is defined as testing at the point where patient care is given, wherever that is located. With this move outside the laboratory walls some problems occur that were not problems within the laboratory. The innovation, apparent simplicity and functionality of POCT provide many challenges for health care funding authorities. In particular, the ability to determine the value which POCT may bring to the patient care process. Point-of-Care testing often starts without knowing if the testing is appropriate for the setting. Many times there is a limited understanding of requirements for licensure, training, documentation, and procedures. Soon there may be several types of instrumentation performing the same testing in various areas of a facility. There may be no evaluation or comparison of the values obtained from these different methodologies and they may not correlate well with each other. Cost-savings that may be available through quantity purchasing may be lost. It is important that a Point-of-Care Testing Program at any of the above sites is carefully planned. The aim of this panel is to summarize existing policies, procedures or guidelines which govern the use of point-of-care testing (POCT) and in particular, any mandatory requirements for accreditation and quality management issues.

Keywords: POCT, Effectiveness, Limitations, Opportunities

O43

Accreditation of Point of Care Testing

Naser Almasi 1 *

1- Lab Director of Isfahan Shariati Hospital Medical Laboratory DCLS (Doctor of Clinical Laboratoary sciences) Lab Director of Isfahan Shariati Hospital Medical Laboratory Examinations are Traditionally Performed on Body Fluids, Excretions, and Tissues, Commonly Known in a Controlled Environment as a Medical Laboratory

On the other hand, the introduction of quality management and accreditation systems in these laboratories increases their interest and interest. Technological advances have led to the use of in-vitro medical devices that are quite easy to use and in vitro (Vitro Diagnostic), which make it possible to perform certain tests at or near the patient. POCT tests provide rapid turnaround of laboratory test results with the potential for faster medical practice. However, POCT trials increase the chance of error by moving testing out of the well-controlled environment of a laboratory and placing the tests in the hands of nurses and clinical support staff with little training and experience . For this reason ,with the increase of these equipment, regulatory and accreditation standards have been increased to ensure the quality of the responses and the monitoring of laboratories. POCT testing may benefit the patient as well as health care providers. If managed with a fully operational quality management system, the risk to the patient and management centers should be considered. for the use of these tests and their needs met. - Evaluation of new or alternative POCT tools, equipment and systems, - Evaluate and approve end-user endorsement suggestions and drafts, - Purchase, installation and maintenance of equipment, - Maintenance of consumables and reagents, - Training, certification and accreditation of POCT system operators, - Quality control and quality assurance. This presentation will attempt to address the technical and managerial requirements of the ISO 22870 standard mentioned for these tests, as well as how to validation them.

O44

Point of Care Test Applications - Current Situation and Future Perspectives

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1- Reference Health Laboratory

Increasing request for use of rapid diagnostics in the facilities out of laboratory mostly in the point of care settings and its advantages and disadvantages brings a question in mind that considering the specifications and limitations of point of care devices, while they are integrated in diagnostic algorithm of diseases and we can use their rapidity and simple usage, the consequences of their constitutional limitations are minimized. Diversity and emerging trend in point of care technology and strong growth of multiplexed point of care testing in one side and increasing role of syndromic approach in surveillance of communicable diseases in another side has made point of care testing as a necessary clinical demand. Raising awareness of clinicians for considering the intended use of these devices and importance of fitting the operational and performance characteristics of them with existing setup used and clinical expectations is one of the most important issues that should be considered while selecting a point of care device. Another point of concern is consistency and validity of results that are very dependent on training plans for operators and other activities that are required for quality assurance.

Keywords: Point of Care Devices, Point of Care Diagnosis, Syndromic Surveillance

Quality Assurance and Risk Management O45 - O48

Dr. H. Bayat, DCLS

O45

Risk-Based Quality Control in Analytical Phase

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Participating in patient care via providing test results is the main responsibility of medical laboratory. The test results must be of good quality so that when used in clinical decision making have the least risk for harm to patients. New approach in quality control emphasizes to more directly consider the ability of quality control in minimizing the risk from reporting erroneous results for patients. This risk-based approach is reflected in the new guidelines EP21 and C24 published by CLSI. EP21 guideline discusses the error sources affecting the whole laboratory practice, including pre-analytical, analytical, and post-analytical phases, and presents strategies to prevent and detect errors; thereby mitigating the risk for patients. C24 guideline, presenting the new QC model called Max E (Nuf) model, focuses on the quality control in analytical phase. The aim of this model is to minimize the increase in the number erroneous results that are reported from the time error occurs to the time the error is detected. Risk of harm for patients resulting from erroneous results, besides the number of erroneous results, is related to two other factors: the severity of harm, and the probability of clinical action based on the erroneous result. Risk Management Index, RMI, is a model for planning QC so that the risk for patients is reduced to the acceptable limit. In this presentation, different aspects of risk-based QC, including the concept of Max E (Nuf) and RMI, will be discussed.

Keywords: Max E (Nuf) IQC, Quality Control, Medical Laboratory, Risk Assessment, Risk-based IQC, Risk Management Index

O46

The Changing Concept of Total Quality Management in the Clinical Laboratory: Critical Need for Improved Post-Analytical Quality

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Laboratory medicine is the branch of medicine that provides objective data to clinicians and other healthcare workers to guide appropriate clinical decision making.Laboratory medicine is integral to many clinical decisions on prevention,diagnosis, treatment,and disease management. It supplies health care professionals with evidence-based data necessary to provide high-quality,safe,effective and appropriate care to patients.A major advancement in the field has clearly been the increasing emphasis on quality.The implementation of process improvements and quality standards originally adopted from the auto industry has had a vast impact on improving pre-analytical, analytical,and post-analytical processes in the clinical laboratory and has increased reliability and confidence in laboratory data in support of patient care.The emphasis on total quality management and adoption of International Organization for Standardization(ISO)15189 and ISO9001 quality standards have ensured appropriate control and documentation of every laboratory process enabling adherence to the highest standards of quality and reducing incidence of intra-laboratory errors that can negatively impact the quality of laboratory test results.In line with these process improvements,the in vitro diagnostic industry has embraced the concept of six sigma quality when developing assay reagents,contributing to much improved biochemical and immunochemical assays and a higher standard of analytical quality.The improvement in assay precision and reproducibility has been truly impressive and has ensured much higher assay performance regardless of assay manufacturer. Thus far the main focus of quality systems in the clinical laboratory has been on analytical processes in the laboratory through internal and external quality control programs. In my opinion a much-neglected aspect of quality systems in the laboratory medicine is the post-analytical interpretation of laboratory test results.Most clinical laboratories and in vitro diagnostic industry have ignored the critical need for sound evidence-based reference intervals in accurate interpretation of laboratory test results.Much of the effort in improving laboratory quality systems has been focused on analytical assay performance and little attention has been paid to appropriate test result interpretation.It appears that most laboratorians and industry partners ignore the fact that the tremendous efforts over the past few decades to improve assay performance are wasted when the test result is not accurately interpreted due to the unavailability of appropriate adult and/or pediatric reference intervals for that specific biomarker. Fortunately,there has been growing recognition of this evidence gap and increased efforts to establish evidence-based databases of pediatric, adult,and geriatric reference intervals for many disease biomarkers.Clinical laboratory reference intervals provide valuable information to medical practitioners in their interpretation of quantitative laboratory test results, and therefore are critical in the assessment of patient health and in clinical decision-making. The reference interval serves as a health-associated benchmark with which to compare an individual test result. Unfortunately, critical gaps currently exist in accurate and up-to-date pediatric and adult reference intervals for accurate interpretation of laboratory tests. These critical gaps in the available laboratory reference intervals have the clear potential of contributing to erroneous diagnosis or misdiagnosis of many diseases. It is imperative that clinical laboratories recognize the critical need for implementation of such evidence-based reference data from healthy population in post-analytical interpretation of laboratory test data. This is in line with the concept of evidence-based medicine defined as‘the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients’.The current practice of using outdated and inappropriate reference intervals to interpret high quality laboratory test data is not only wrong but also dangerous and poses considerable risks to the patient and increased likelihood of misdiagnosis and patient error. In closing, what is critically needed in the field of laboratory medicine is building a culture of innovation and adopting the concept of evidence-based laboratory medicine across the continuum of the laboratory testing process including post-analytical interpretation of laboratory test results using the latest evidence-based reference intervals.

Keywords: Quality Control, Laboratory Medicine, Post-analysis, Reference Interval, Result Interpretation, Risk, Total Quality Management

O47

Risk Management in IVD Manufacturers, Relation between Manufacturer and User

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In vitro Medical Devices (IVD) manufacturers are generally required to have a quality management system as well as processes for addressing device related risks.The IVD manufacturers shall establish,document and maintain throughout the life-cycle an ongoing process for identifying hazards associated with an IVDmedical device, estimating and evaluating the associated risks,controlling these risks, and monitoring the effectiveness of the controls.Risk management principles should be applied throughout the life cycle of medical devices. Risk management is an integral part of the medical device product development lifecycle.It helps medical device developers ensure that the product is reliable,works as expected and causes no harm to the patients,operators or the environment.In other words,the main purpose of the risk management cycle is to reduce or mitigate the chances of failure in the product.Medical laboratories and IVD manufacturers depend on each other to achieve quality in laboratory testing.manufacturers develop examination procedures,validate their performance and document those performance claim and instructions for use. laboratories typically verify the manufacturers performance claims,then establish quality control procedure to verify the achievement of the intended quality in routine operation.Relation between clinical laboratory as customer with IVD manufacturer is critical point in hazard identification,risk analysis and risk control.The manufacturer shall use one or more of the following risk control options in the priority order listed: Inherent safety by design,protective measures in the IVD medical device itself or in the manufacturing process and information for safety.The users must be note and aware from protective measures and information that use for risk control by manufacturer.

Keywords: Risk Management, IVD Manufacturer, Clinical Laboratory

O48

Risk Management

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Nowadays there is a significant evolution in the field of standards. Many standards are issued, and outdated standards are being changed and revised very rapidly. But a prominent specification is obvious; that is the new risk-based approach to the preparation and revision the standards. It is believed that human resources must look at the issues including organization, products, market, and client with a risk-based mentality. Top leaders and directors of the organizations must follow the risk-based thinking and approach, and given this improve the past approaches. Detecting and controlling risk is of the main activities of modern leaders and directors; so pioneering and winner organizations have certainly established the risk management process efficiently and effectively. ISO 31000 and ISO 15189 are based on the risk management. The main topics to be discussed in this lecture are:

- Risk-based mentality and approach
- Establishing the risk-based culture
- Risk identification
- Risk assessment
- Risk control
- Assessment of risk management

Keywords: Risk, Risk-based Approach, Risk Control, Risk Identification, Risk Managem

Posters

Blood-Based Cancer Testing

P1 - P10

P1

Evaluation the Expression Level of MicroRNA-192 in AML Patients

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MicroRNAs (miRs) are one of the newest biological molecule in genetic. They are a group of short, non-coding RNAs that have 18-25 nucleotids. These mulecules have an effective role in different cellular activities like; cell cycle regulation, apoptosis, hematopoiesis and neurotransmitter synthesis. There is also a close relevance between these molecules and cancers. Recent studies confirm oncogenic or tumor suppressoric role of miRs in cancer cells. Current study was designed to evaluate the expression level of miR-192 in patients with Acute Myeloid Leukemia (AML). The expression level of miR-192 was evaluated by Real-Time PCR method in 50 AML patient blood samples. 10 blood samples of healthy individuals were selected as controls and evaluated by this method too. The results of research showed up-regulation of miR-192 in patients($p=0.004$). No significant relationship was found between demographic findings such as age, sex, platelet count and miR-192 expression. The expression level of miR-192 was significantly higher in patients with NPM1 ($P = 0.005$) and FLT3-ITD ($P = 0.01$) mutation. It was observed, significant difference in expression level of miR-192 among different cytogenetic groups, so that, patients with Intermediate cytogenetics had the highest expression level of miR-192 ($p = 0.002$). The expression level of miR-192 in patients who achieved complete remission was higher than resistant patients after induction therapy, but this difference was not statistically significant ($p = 0.08$). Current study has proved that, miR-192 has a significant increase in AML patients. Therefore, it is expected that this molecule acts as an oncogen in AML.

Keywords: Mir-192, Oncogene, AML, NPM1 Mutation

P2

Liquid Biopsy Epigenetic Evaluation as Biomarkers in Breast Cancer Diagnosis

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Introduction: Breast cancer (BC) metastasis might be latent or occur several years after primary tumor removal, may fail to show intra-tumoral heterogeneity and genetic modification which occur during tumor evolution. It is essential to discover new non-invasive biomarkers to improve anticipation of recurrence risk in BC patients. Material and Methods: The plasma levels of miR-129, miR-203a and also methylation of DAPK1, CAVIN3 gene promoters were evaluated to investigate their diagnostic potential in BC and BC metastasis. Invasive Ductal Carcinoma blood samples were divided into 3 groups of 30 patients based on their stages as: I, II/III, IV. 30 normal individuals were also recruited as control group. Real-Time PCR and MethySYBR assays were conducted to evaluate miR-129, miR-203a expression levels and DAPK1, CAVIN3 promoter methylation frequencies. Results: MiR-129 and miR-203a expression levels were significantly downregulated in BC. However, only mir-129 decreased expression level differentiated significantly between metastatic and nonmetastatic groups. Methylation of CAVIN3 gene indicated it could differentiate significantly between metastatic and nonmetastatic groups, and also differentiate between various progression stages of the condition. DAPK1 methylation level demonstrated increase in BC cases compared to normal, though not significantly. Conclusions: miR-129 and miR-203a may both act as tumor suppressor miRNAs and potentially diagnostic biomarkers in BC. MiR-129 may be used as a potential diagnostic biomarker in BC metastasis. Promoter hypermethylation of DAPK1 and CAVIN3 genes in plasma can be potential BC diagnostic biomarkers. This suggests the potential usage of CAVIN3 promoter methylation as a non-invasive strategy for metastatic BC diagnosis.

Keywords: Epigenetics, Biomarker, Breast Cancer

P3

Circulating Tumor DNA (ctDNA) in Colorectal Cancer Early Detection, Monitoring and Screening: a Systematic Review

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Background Colorectal cancer (CRC) is the third most common cancer and the fourth cause of cancer-related deaths worldwide. Early detection plays a crucial role in cancer prognosis, treatment and survival, particularly in CRC. ctDNA is a subset of cell-free DNA (cfDNA) originated from tumor cells, which can provide specific and early detection. ctDNA can be used in staging, screening, monitoring response to the treatment. Methods This systematic review article uses articles from PubMed, Google Scholar, Scopus, and web of science from 2010 to 2019. The primitive number of related articles was 38 from which only 24 articles were reviewed. Results The previous investigations have detected ctDNA in different body fluids, such as serum, plasma, urine and stool, which provides a cost-effective and non-invasive detection. Detected genetic alterations are valuable sources for determining tumor features such as stage, prognosis and response to the treatment, which subsequently aids in treatment selection in targeted therapy. KRAS and BRAF are the most studied gene mutations in CRC liquid biopsy. For instance, KRAS mutation is detected in 40% of CRC cases, which also suggests resistance to anti-EGFR antibody therapy. ctDNA analysis by polymerase chain reaction (PCR) is cost-effective, accurate and rapid. Indeed, different sensitivity and specificity are reported based on fluid and analyzed genes. Conclusion ctDNA analyzes provides specific, cost-effective and early detection in CRC. Indeed, it provides valuable information about cancer prognosis, treatment and survival. Taken together, ctDNA can be a novel promising tumor marker for CRC screening programs and early detection.

Keywords: Circulating Tumor DNA, Colorectal Cancer, Cancer Screening, Early Detection

P4

Investigation the Apoptotic Potential of Juniperus Excelsa Fractions on Acute Promyelocytic Leukemia Cell Line (NB4) and Its Synergistic Effect with ATO

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Introduction: Acute promyelocytic leukemia (APL) is a subtype AML, characterized by the translocation fusing the PML/RARA gene. Arsenic trioxide (ATO) has a toxicity profile and exerts dose-dependent dual effects on APL cell. Today, the use of traditional medicine drugs due to less toxicity and side effects for patients, has been considered. Juniperus excelsa is distributed different part of the world. This plant has been traditionally used to treat various problems. In this study, fractions of this plant and synergistic capability with ATO has been investigated on acute promyelocytic leukemia cell line (NB4). Material and methods The cytotoxic activity of different fractions of J. excelsa on NB4 cell line was evaluated by MTT assay. Apoptosis was assessed by flow cytometry. Real-time PCR determined the expression levels of some apoptosis-related genes. Results: Results showed that chloroform fraction was more effective than the rest. MTT assay showed that the metabolic activity of cells in the dose of 2.5 µg / ml of chloroform fraction decreased by 50% compared to the control group (IC50 2.5µg/ml). The synergistic effect of ATO and this fraction was confirmed. The results of apoptosis were confirmed by flow cytometry. Expression of CASP3 and Bax genes were significantly upregulated to compare with control group, while Bcl-2 gene was downregulated in NB4 cell line ($p<0.05$). Conclusion: The results of this study demonstrated the toxicity of the chloroform fraction of Juniperus excelsa. The more studies are needed in the future so that it can be used as anticancer drugs.

Keywords: Acute Promyelocytic Leukemia, Juniperus Excelsa, Apoptosis, ATO

P5

Aptamers, a Recent Approach for Specific Detection of Tumor Cells

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1- IBTO

Cancer cells include genetic mutations that give permission to them to succeed in avoiding the regulatory processes necessary to maintain the health of tissues and organs. In addition, there are great number mechanisms for malignancies, each of which is constantly evolving with different combinations of genetic mutations in cancer cells. This makes it difficult to diagnose and treat cancer. Some assays are based on the detection of specific mutations, and some are designed to find out all mutations by sequencing. Each of these access has its advantages and disadvantages, and many of these diagnostic methods require significant sample preparation to be prepared in a given volume. While, primary genomic material in the samples is limited and it is possible to lost residual DNA during processing. So, it is important to design a method for assay that can prepare the sample in a way that preserves the original genetic content and enables it to be reused. We have been informed recently A device has been invented that Capable of specifically trapping cancer cells and their gDNA isolation for amplification and sequencing. This kind of splitting let to gDNA to be conserved and purified in the channel and amplifying and analyzing will be possible without losing the original template. If there was mutation in cancer cells patient it is detected and physician are able to cure them by using the best and most effective therapeutic option.

Keywords: Aptamer, CTC, gDNA

P6

Development of SW-48 Colon Cancer Cell Line Resistant to Regorafenib and Delivery Study of siRNA Targeting β1 Integrin Using DDAB-mPEG-PCL Hybrid Nanoparticle

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Background: Colorectal cancer is the third most common cancer worldwide and drug resistance to chemotherapy agents is a major challenge in the field. Regorafenib is a Receptor Tyrosine Kinase Inhibitor agent which resistance to it via β1 integrin plays an important role in tumor recurrence. Downregulation of β1 integrin using siRNA would be a promising method for overwhelming such resistance. Delivery of siRNA by Lipid-polymer hybrid nanoparticles (HNPs) is an effective strategy. So, in this study Regorafenib resistant sw-48 cell lines was established and the effect of β1 integrin downregulation using siRNA and HNP complex in combination with Regorafenib/HNPs were assessed. Methods: Regorafenib resistant SW-48 cell line was created by treating cells with 4 consecutive rounds of Regorafenib. DDAB-mPEG-PCL hybrid nanoparticles were synthesized using single step nanopercipitation method and characterized by DLS. The mRNA expression level of β1 integrin was measured by Real-time PCR technique. Results: Regorafenib resistant SW-48 cell line was generated in which Regorafenib IC50 for non-resistant and resistant cells were 21.04±.012μM and 63.36±1.3μM, respectively. The result of DLS showed that HNPs size and charge was 66.56±1.5 nm and +18.6±0.7 mv, respectively. β1 integrin gene expression was significantly different between resistant and non-resistant cells ($p<0.05$). Downregulation of β1 integrin gene expression induced by siRNA/HNP complex in combination with Regorafenib/HNPs was remarkably more than adjusted controls ($p<0.001$). Conclusion: Our results indicated that combination therapy using siRNA/HNP and Regorafenib/HNPs complex decreased β1 integrin gene expression which may have effects on drug resistance signaling pathways.

Keywords: Colorectal Cancer, Regorafenib, β1 Integrin, SiRNA, Lipid-Polymer Hybrid Nanoparticle

P7

Investigating of the miRNA 34b/c Silencing by DNA Methylation in Patients with Chronic Lymphocytic Leukemia

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Objective: chronic lymphocytic leukemia (CLL) is the clonal malignancy, associated with the proliferation of mature, long-living B-cells in the blood, bone marrow, and lymphoid tissues. DNA methylation is one of the epigenetic mechanisms that can be helpful in diagnosis and treatment and may even be used in the future for screening. In this study, the DNA methylation status of the miRNA 34b/c tumor suppressor gene promoter and its association with clinical and laboratory symptoms of patients with CLL were investigated. Materials: In this study DNA methylation status of miR 34b/c gene was evaluated in 50 CLL patients and 50 controls by MSP-PCR. Statistical analysis was performed using SPSS 16 software. P values of less than 0.05 were as statistically significant. Results: There was a significant difference between methylation of miRNA 34b/c and control groups in methylation frequency (42% vs. 0.0%; p value<0.001; $\chi 2$=26.582). The frequency of DNA methylation of miRNA 34b/c in both sexes was not statistically significant (p value=0.99). A significant correlation was observed between methylation status of miRNA 34b/c and organomegaly (P value=0/034) as well as, hemoglobin and white blood cell levels with the methylated status of miRNA-34b/c (P value=0.001, P value= 0.001, respectively). However, binary logistic regression analysis showed organomegaly as the only clinical biomarker revealed a statistically significant association with the of miRNA-34b/c gene methylation status (P value=0.048). Conclusion: hyper-methylation of the studied miR-34b/c gene is likely to play a key role in CLL, and may also be used as a prognostic biomarker in CLL disease.

Keywords: Chronic Lymphocytic Leukemia (CLL), Epigenetic, MiR-34b/c, Methylation

P8

Role of Small RNAs in Breast Cancer: Promotion, Regulation, Diagnosis and Treatment

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MicroRNAs (miRNAs) are a class of noncoding small RNAs that regulate gene expression at translational or posttranslational levels. Dysregulation of miRNAs has been associated with a variety of human diseases, including cancer. Breast cancer is one of the most common cancer in the world that characterized by imbalance between tumor suppressor and oncogenic miRNAs. In cancer, some tumor suppressor miRNAs are often low expressed in cancer, whereas oncogene miRNAs are overexpressed in cancer. Investigations suggest that the miRNA-expression profile is a novel diagnostic and prognostic biomarker for breast cancer. MiRNA-based therapies have emerged as new approach for the treatment of cancer through target of miRNAs and restore gene expression in the cells to reverse back in normal state. In this review, we summarize the recent advancement of miRNA research in breast cancer, in particular, the roles of miRNAs in breast cancer stem cells, epithelial-to-mesenchymal transition, chemoresistance, therapeutics, diagnosis, and prognosis.

Keywords: Microrna, Breast Cancer, EMT, Prognosis, Diagnosis, Treatment

P9

Report of a New Six-Panel Flow Cytometry Marker for Early Differential Diagnosis of APL from HLA-DR Negative Non-APL Leukemia

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Background: Although AML-M3 (APL) and HLA-DR negative non-APL are characterized by negative HLA-DR antigen, they are different entities with similar morphology in some cases. The aim of this study is the precise, differential diagnosis of APL from HLA-DR negative non-APL by flow cytometry to narrow the diagnosis window. Methods: Bone marrow or blood samples of 580 AML patients were analyzed, and flow cytometry and molecular analysis were performed for the diagnosis of blood disorders. In 105 HLA-DR negative AML patients, expression of HLA-DR, CD33, CD117, CD11b, CD64, CD34, CD9 and myeloperoxidase staining pattern were evaluated. Results: Fifty-six patients were diagnosed with APL, and 49 patients were diagnosed with HLA-DRnegative non- APL. The APL blasts expressed CD33, CD117, CD64, and CD9 in 100%, 80.3%, 94.6%, and 100% of the cases, respectively. HLA-DRnegative non-APL blasts expressed CD33, CD117, CD64 and CD9 in 75.5%, 59.1%, 32.6%, and 73.4% of the cases, respectively. APL cells were negative for HLA-DR, CD11b, and CD34 in 96.4%, 94.6%, and 91.0%, respectively. Blasts in HLADR negative non M3-AML were negative for CD11b, CD117, and CD34 in 77.5%, 40.9%, and 22.4%, respectively. We also investigated myeloperoxidase (MPO) staining pattern and found strong diffuse reaction in APL cells while HLA-DR negative non-APL cells showed focal positive reaction. In all of the APL patients, except for one, PML/RARA translocation was positive, and in another case with HLA-DR negative non-APL, PML/RARA and other translocations were not detected. Conclusions: The six-panel combination profile rapidly and specifically identifies APL from other HLA-DR negative AML.

Keywords: APL, HLA-DR Negative AML, Flow Cytometry, CD64, CD9

P10

The Role of Laboratory Sciences in Diagnosis of Extracellular Neoplasm of Plasma Cells of Bone Marrow in Gastrointestinal Tract Disorder

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Introduction: Abnormal growths of plasma cells,are diseases in which certain type of blood cells named plasma cells become cancerous.Neoplasm of extra bone marrow comprise 3 to 4% of all types of plasma cytomas form and rarely involve the gastrointestinal tract. Methods: This review article was conducted in 2019 by searching in databases such as Science direct,PubMed,Elseiver,Google Scholar.40 articles were studied between 2013 and 2019,which 15 articles of them were selected that met the criteria for entering this article. Findings: In this article because of rarity of this disorder,case report articles have been used that laboratory findings and symptoms have been observed in most patients who referred to hospital. Symptoms of this small bowel disorder include abdominal pain,vomit,loss of weight,bleeding,jaundice,diarrhea,and in laboratory tests,Test CBC,tests of liver and kidney function in all patients aren't observe as abnormal and in some rare cases hyperbili robinmia was observed. As involving colon,abdominal pain,more in left side,changes in bowel habits, diarrhea,rectal bleeding and intestine obstruction are observed and its laboratory findings usually include decreased hemoglobin,hematocrit and increased calcium.Laboratory findings of this disorder in the stomach suggest that the person may be suffering anemia,and in these data one can observe mildly increased Trans Aminases,positiveness of facal Giac stool and hyperglobinemia Test,and the presence of M protein in serum and Bence Jones protein in urine.Conclusion: In this article, we tried to make timely diagnosis in the field of laboratory science by expressing laboratory findings and appropriate diagnostic method in this disorder.

Keywords: Extra Medullary Plasma Cell, Laboratory Finding, Plasma Cell Neoplasms, Hematology and Disorder Digestive

Challenges of Detection of Drugs and Psychotropic

P11

P11

Detection and Determination of Methadone in Biologic Samples Referred to Esfahan Legal Medicine Center by DLLME GC-MS

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Detection and Determination of methadone in biologic samples referred to Esfahan Legal Medicine Center by DLLME GC-MS Zeinab Tofighi Zavareh*1, AliReza sabori, Ali Sileimanpor3 1,2,3Esfahan Legal Medicine Center Abstract Introductin: Methadone is a synthetic narcotic drug and widely used in the treatment of opiated addiction. In this work dispersive liquid-liquid microextraction and Gas chromatography-mass spectrometry (DLLME-GC-MS) was applied for detection and determination of methadone from plasma, urine, hair, nail, liver and stomach. Method: For the extraction, mixture of acetonitrile as disperser solvent and carbon tetrachloride as extraction solvent was inject rapidly by syringe into a test tube by conical bottom containing aqueous solution of methadone and 3-Nitro Phenol as internal standard. A cloudy solution (aqueous solution, acetonitrile and carbon tetrachloride) was formed in test tube. After centrifuging, 1.0 µl of sediment phase was inject into the GC-MS and methadone determined. In order to obtain optimum condition of extraction, parameters affecting on the extraction such as: extraction and dispersive solvent type and volume, salt addition, time of extraction, pH, time and rate of centrifuging and effect of ultra-sonic wave were studied. Results: Consequently enrichment factor, detection limit,relatively standard deviation (RSD) and linearity were obtained 170.0, 0.04ngml-1, 1.69% and 1-100ng ml-1 respectively. As a result, the proposed method successfully was used for analysis of real samples such as: plasma, urine, hair, nail, liver and stomach. Conclusions:The proposed method shows low detection limit, good precision, very short extraction time, and low consumption of sample and organic solvent.

Keywords: Methadone, AnchorDLLME-GC-MS, Detection

Education of Medical Laboratory Sciences in Iran

P12 - P15

P12

Challenges of Training and Professional Laboratory Science Experts

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Laboratory science is a subdivision of the medical group that plays an important role in the diagnosis, treatment, prevention and follow-up of various diseases. The purpose of this study is to discover and identify challenges and problems in the process of education and employment of graduates of laboratory sciences in Iran. Interviews with qualified professors and laboratory science students were used for data collection. The results of this study show that the challenges of teaching laboratory science in Iran are: - The weakness of the practical foundation of university education - Lack of a system of accurate evaluation of the teaching of the professors - Lack of adequate attention to the fields of laboratory science at the policy level - The complete dependence of the laboratory sciences on the pathologists - A superficial approach to teaching - Non-collaboration of staff at the medical center in student education - Use of non-relevant discipline graduates in the laboratory - Not paying attention to the living problems of the laboratory staff - Not paying attention to the hard and harmful work of the lab - Cancellation of doctoral degree in laboratory science.

Keywords: Education, Laboratory Sciences

P13

The Importance of Practical Training in the Success and Employment of Laboratory Graduates

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Clinical laboratories play a crucial role in the health of a community and require trained and experienced personnel. Therefore, graduates of laboratory sciences will serve to improve community health by performing routine clinical trial methods. To do this, students must acquire the necessary knowledge and skills during the internship. Various problems reduce the efficiency of apprenticeships in laboratory science students. Identifying and resolving these problems is essential to enhance the efficiency of this unit. The purpose of this study was to teach the importance of practical courses in the success and employment of graduates of laboratory sciences. Considering the above mentioned issues, reducing the number of theoretical courses per semester with proper training and direct supervision of students with the help of capable instructors. A lot will help students learn properly. Also, due to the effective role of students in the field of health, theoretical and practical exams are necessary to prevent graduates from entering the labor market in order to prevent possible damage to the health system of the country.

Keywords: Education, Laboratory Sciences

P14

Problems and Solutions for Public Laboratory Science Education in Iran

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Bakground: With the development of societies health education & prevention have entered a new phase. It is no longer the old way that Medical information was only available to Wise Rather, there are various media & sources about it. Communities & governments move in the same direction to make people know what lifestyle they should take to ensure their blood test results will be balanced & healthy. Methods: To know the status of (part of) the Iranian community in Tabriz, Verbal questions were asked & statements of several employees in this field were collected. Results: In the oral questioning of 78 people, only 8 people knew that unbalanced blood minerals are associated with infections, injuries, & diseases that can even lead to surgery. Of these, only 14 were positive for continuous screening. Studying of several laboratory journals also confirmed the fact that most people's view about testing is merely diagnosis & follow-up. Conclusion: Prevention is better than cure is a fact that is not well understood yet. Insurance companies can require their clients to have a monthly check-up, Producing & publishing brochures & videos to change negative attitudes & increase public awareness, finally raising public awareness & reducing the cost of testing & treatment will be the result of it.

Keywords: Public Education, Public Awareness, Monthly Health Check, Laboratory Patient Status, Laboratory Sciences

P15

Comparison of Iran in Training of Practical Skills in Laboratory Sciences Students with Other Countries of the World

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Background: Medical Laboratory science is one of the most popular, diverse, practical, and skillful disciplines in most countries, especially Iran. Also, education and degrees in this field have had ups and downs so far. The purpose of this study is to evaluate the training conditions of efficient specialists in terms of sufficient practical knowledge and technical expertise in Iran compared to other countries. Method: The study is a systematic review of relevant documentation on science and skills training for laboratory science students from 1984 to 2020 and after finding the relevant keywords in MeSH, journals and databases of Springer, Elsevier, PMC, Research Gate, etc. were used and finally 17 articles were selected. Result: In the related articles, there were no significant differences between the topics of educational subjects in Iran, the European: union:, the United States and Canada, Japan, but the impact of skill and laboratory training on student learning is very significant. Discussion and conclusion In the past decades many diseases were diagnosed and treated solely by clinical practitioners, but today, according to scientific citations in the world, more than 70% of clinical diagnoses rely on laboratory findings and diagnoses and a wide variety of laboratory tests, the establishment of standardization and quality control systems has made laboratories a major pillar of health. Therefore, in order to enter the professional force more emphasis is placed on the scientific and skill training of students in this field.

Keywords: Medical Laboratory Science Education, Practical Skills, Medical Diagnosis Laboratory, Iran

Ethical Issues in Laboratory Medicine P16

P16

Assessment of Familiarity of Laboratory Staff Attending one Day Professional Ethics Workshop in Mashhad University of Medical Sciences

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Introduction: The issue of professional ethics and ethics in clinical laboratory staff is one of the most important and fundamental issues in relation to the rights of patients and their clients, which is unfortunately sometimes neglected. The purpose of this study was to evaluate the familiarity of laboratory staff attending one day professional ethics workshop in Mashhad University of Medical Sciences. Methods: This cross-sectional study was conducted by designing a questionnaire which was conducted by a researcher in consultation with the experts in this field, and finally the answers were analyzed. Results: Overall 58 participants, 21 Lab Technician (Associate Degree) (36.2%), 26 experts (44.83%) and 11 masters (18.97%), mean age ranged from 21 years to 53 years. Work was from 2 years to 29 years. Finally, 12 (20.69%) persons had complete familiarity with the concepts of medical and professional ethics, 44 (76%) had partial acquaintance and 2 (31.3%) had no acquaintance. Discussion and conclusion: Medical diagnostic laboratories are one of the most important pillars of the health system around the world and, given their sensitivity and serious responsibilities, they must be committed to adhering to their professional and ethical principles, and to educate this laborious and influential scientific community in the process of accuracy, accuracy. And the results of the tests, and especially of the new staff, are significant.

Keywords: Medical Ethics, Professional Ethics, Staff, Medical Diagnosis Lab

New Developments and Challenges in Laboratory Diagnosis of Cardiac and Renal Diseases

P17 - P20

P17

Comparative Evaluation of the Lipid Parameters, Fasting Blood Sugar, hs-CRP and Creatinine in the Serum of Patients with Cardiovascular Disease and Healthy Individuals

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Background: Abnormal lipid parameters have been recognized as an important risk factor in the development and progression of cardiovascular disease (CVD). Changing the level of total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), and triglycerides (TG), fasting blood sugar (FBS), lipoprotein A (LPA), creatinine (cr), High sensitive C reactive protein (hs-CRP) and levels of high-density lipoprotein cholesterol (HDL-C) may increase risk of CVD. This study aims to compare TC, LDL-C, HDL-C, TG, FBS, LPA, creatinine, and hs-CRP between healthy individuals and individuals with CVD disease who have at least one clogged heart-vessel Methods: We assessed 375 healthy and patient persons with age between 40 and 80 years old. The sera were analyzed for the levels of TC, LDL-C, HDL-C, TG, FBS, LPA, Creatinine and hs-CRP., Then analyzed by SPSS by adopting a significance level for a value of $p<0.05$. Results: The results showed that serum levels of TC, LDL-C, TG, FBS, and hs-CRP have significantly increased but HDL-C significantly reduced in patients compared to the control group. LDL slightly and non-significantly elevated. LPA and creatinine slightly but significantly increased. Conclusion: These results indicate that the lipids profile has a significant impact on CVD risk The observations from this study provide new insights into the understanding of CVD development and emphasize the importance of controlling the increase of lipids and risk factors to prevent CVD. These findings show that controlling lipid concentration and blood sugar in early adulthood can prevent and reduced the incidence of cardiovascular disease risk in later life.

Keywords: Cardiovascular Disease (CVD), Lipid Parameters, Fasting Blood Sugar, Creatinine, High Sensitive C Reactive Protein

P18

Evaluation of Antibiotic-Resistance Patterns and Clinical Sterain E.Coli ESBL Producing CTX-M Genes by PCR from Urine Samples of Patients Admitted to Hospital Martyr Yahyanejad Babol

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Introduction: Escherichia coli is one of the most common bacteria isolated from human infections and causes urinary tract infection. It is resistant to beta-lactam antibiotics due to the acquisition of plasmids that encode broad-spectrum beta-lactamases. Phenotypic and genotypic evaluation of CTX-M gene in this hospital and its gene region were investigated. method: This descriptive cross-sectional study was performed from July to December 2014 on urine samples of patients referring to Shahid Yahya Nejad Medical Center in Babol, Iran. Then, by phenotypic test, ESBL-producing strains were identified and by the REAL-TIME PCR method, the CTX-M gene was identified in ESBL-producing strain. Data were analyzed by SPSS-20, T-Test, K2 software. findings: Of 1842 isolates of 84 E. coli isolates, 29 isolates (34.5%) were generators of broad-spectrum beta-lactamases. Of these, 20 isolates (69%) possessed CTX-M phenotype with REX-TIME PCR. P <0.05). Conclusion: The results show that meropenem, ampicillin sulbactam, piperacillin-tazobactam and amikacin medications appropriate to initiate empiric treatment of Escherichia coli producing ESBL until ready answer Antibiotic. According to the results of this study, the genes produce beta-lactamase CTX-M Drsvyh E. coli this area of There is a high need for monitoring and monitoring of antibiotic use. Due to the presence of CTX-M gene in a high percentage of these strains, further phenotypic and genotypic studies in pathogenic bacteria of this region seems necessary.

Keywords: Escherichia Coli, Resistance, Antibiotic Resistance, Beta-Lactamase Wide Range (ESBL)

P19

Evaluation of Modulatory Effects of Caffeic Acid on Enzymatic and Oxidative Changes Induced by Arsenic in Kidney of Mice

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Background: Arsenic (As) is one of the most widespread environmental pollutants. Arsenic exposure has become a major threat to public health and has been recognized as an important and influencing factor in many human diseases disorders. Methods: Twenty-four adult male mice were randomly divided into 4 groups of 6 each. Group 1 was considered as control and received normal drinking water and basal diet. Group 2 received 200 ppm arsenic in drinking water. Group 3 received arsenic (200 ppm), and caffeic acid (60 mg/kg; i.p.). Group 4 received caffeic acid (60 mg/kg; i.p.) during the experimental study. At the end of the experiment (21 days), tissue sampling was done and the levels of some biochemical indices Including (LDH), (AST), (ALT), catalase, glutathione, carbonyl contents of proteins, (MDA), and (FRAP) were determined in renal tissue extract using validated methods. Results: The results showed significant decrease in catalase, glutathione, and FRAP values in group 2 relative to controls. Significant enhancement of renal LDH and malondialdehyde was also detected in arsenite-exposed group. Simultaneous administration of caffeic acid with arsenite (in group 3) notably enhanced catalase and glutathione levels as compared to group 2. Moreover, renal LDH and malondialdehyde levels in group 3 had no significant difference relative to control group. Conclusions: it can be concluded that administration of caffeic acid improves enzymatic and oxidative alterations in renal tissue of As-intoxicated mice. These effects might be mediated by antioxidant as well as metal chelating abilities of caffeic acid.

Keywords: Arsenic, Caffeic Acid, Kidney, Enzyme, Oxidative Status

P20

New Insights in to Adipose Tissue Gene Expression of Long Non-Coding RNAs; MALAT1, TUG1 in Obese and Normal-Weight Women: Is It Linked to Central Obesity Parameters and Renal Injury Markers?

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Background: An impaired adipose tissue function caused by a dysregulated gene expression contributes substantially to obesity. There is fresh evidence about regulatory roles of two lncRNAs; MALAT1 and TUG1 as emerging epigenetic players in regulating energy metabolism and insulin signaling. However, the clinical pertinence of these lncRNAs in the field of obesity research in human is not yet obvious. Methods: Here, we investigated mRNA expression of MALAT1 and TUG1 in visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT) of obese female participants (n=20) and normal-weight women (n=19). We also evaluated the association of their gene expressions with central obesity indices, insulin resistance and kidney damage indices. Results: The results showed lower mRNA levels of TUG1 in both the VAT and SAT of obese women, compared to the controls. Furthermore, TUG1 expression in SAT and VAT positively correlated with central obesity indices including BMI, waist to height ratio, abdominal volume index (AVI) and conicity index (CI) and with HOMA-IR in all participants. Moreover, TUG1 expression in SAT positively correlated with creatinine levels and total protein in obese group even after adjusting with HOMA-IR. The association of TUG1 transcript levels with obesity indices remains significant after adjusting HOMA-IR. The expression of MALAT1 did not differ between two groups for any tissue. However, it was positively correlated with HOMA-IR in whole population. Conclusions: It seems likely that transcript levels of TUG1 in VAT and SAT are involved in kidney abnormalities and central obesity parameters in the context of obesity.

Keywords: Epigenetics, LncRNA, Obesity, Renal Disease Markers, Adipose Tissue

New Developments in Immunohematology
P21 - P25

P21

Evaluation of TLR4 rs4986790 and rs4986791 Gene Polymorphisms and the Risk of Infection in Childhood Acute Leukemia

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Background: Infections cause substantial morbidity and, in severe cases, death in patients with childhood acute leukemia (ALL). Toll-like receptors (TLRs) play a central role in initiating the innate immune response. Polymorphisms in TLR4 gene have previously been shown to be associated with an increased risk of infection, in both adults and children. In this study we examined the potential association between TLR 4 rs4986790, rs4986791 gene variants and febrile neutropenia as a strong indicator of infection in these children. Methods: Genotyping analysis was performed on fifty one pediatric ALL patients using ARMS-PCR and PCR-RFLP used to detect Asp299Gly and Thr399I1e alleles of the TLR4 gene respectively. Statistical analyses were performed using SPSS 16.0.The level of statistical significance was considered as $P < 0.05$. Results: TLR 4 SNP rs4986790, rs4986791 were found in 5.8% and 7.8 of ALL patients respectively. We were unable to find an association between our patient cohort, possibly due to the low frequency of the variant alleles and small number of patients. Conclusion: Genetic complexity, ethnicity, influence of other genes or polymorphisms may overcome these polymorphisms in our patients. Further study with a larger population is required to confirm the findings and to evaluate Impact of this polymorphism in relation to other genetic factors.

Keywords: TLR, Acute Leukemia, Infection, Neutropenia

P22

Recovery and Assessment of Leukocytes from Leukocyte Reduction Filters

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Background: Leukocyte reduction filters (LRFs), used by blood banks to facilitate the large-scale collection of blood products from healthy donors, are an alternative source of human blood cells. LRFs contain many more leukocytes than can be obtained from a volunteer research participant under common guidelines. Methods: For recovery of blood cells we use Various volumes of Hank's buffered saline solution that moderately forced through the TLRE filter to counter-elute the trapped cells. For Isolation of PBMCs and leukocyte subsets Leukocytes were isolated by density-gradient separation over ficoll (GE). Immediately following their isolation, the purified T cells and monocytes were resuspended in growth medium (RPMI1640, 10% FBS, and antibiotics). To characterize the expression of cell surface markers, cells were stained with combinations of fluorescently-labeled monoclonal antibodies. RESULTS: Laboratory data were compiled in Excel spreadsheets (Microsoft). Statistical analyses and charting was performed using SigmaPlot 11.0 (Systat) and Omics Explorer 3.2 (Qlucore). Statistical significance was set at the conventional level of $\alpha = 0.05$ CONCLUSION: Among 10 TLRE filters, the median yield was 356×106 cells (range = 200 – 549×106 cells). Viability of the recovered cells was routinely <70%. lymphocytes in cultures containing PHA and IL-2 exhibited a 'blasting' phenotype as evidenced by appreciable increases in cell size and complexity.

Keywords: LRF, Leukocyte Assessment, Recovery of Leukocyte

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Evaluation of Adverse Effects Following Blood and Blood Components Transfusion During 1397

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Background: In order to detect, gather and analyze unexpected or undesirable effects related to transfusion for reclaiming their causes and prevent their recurrence hemovigilance is essential. Hemovigilance is set of surveillance procedures including the entire blood transfusion chain, from blood and it's components requests and preservation of them in blood bank, through to cross-match tests before transfusion, during transfusion and their follow up. Methods Data were gathered from Iranian national hemovigilance center during 1397. Results The current study found that by the end of 1397 the hemovigilance system is established in 85% of hospitals in the country. A total of 5278 events were reported from all over the country to Iranian national hemovigilance center in 1397. all of which concerned immediate reactions. Adverse events were more frequently in women (59. 62%). Overall 80.92% report were associated with pack cell transfusion, 11.41% were associated with platelet transfusion and 7.6% were associated with ffp. As in 1397 febrile non hemolytic(FNHTR) and allergic reaction were the most frequently reported events respectively. the most frequently events were happened in Tehran and Isfahan and Khorasan Razavi provinces in 1397. Conclusion This study showed better assessment and understanding of transfusion reactions in 1397, which will help to improve the quality of blood transfusion and provide further safety of patients undergoing transfusion therapy.

Keywords: Adverse Effect of Transfusion, Hemovigilance

P24

Evaluation of the Association between alpha-TNF Polymorphism and Risk of Development of Inhibitors in Patients with Hemophilia A

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Background and objective: Hemophilia A (HA) disease is a hereditary and bleeding disorder caused by a deficiency or lack of factor VIII. The study aimed to investigate the association between the genetic factor and TNF-α polymorphism (308G> A) in patients with resistance to factor 8 injection compared to those responded. The development of resistance therapy to hemophilia A is based on their inhibitory effect against Injectable factor and their comparison Methods: This case-control study was performed on 40 hemophilia A patients. Patients were randomly divided into two groups of refractory and non-refractory (control group) based on factor 8 level Next, measure TNF-α (308G> A). Genotypes of patients were evaluated for TNF-α (308G> A) using ARMS PCR technique. Finally, the data were analyzed by SPSS software version 18 and level of significance (P <0.05)). Results: Analysis of TNF alpha polymorphism (308G> A) showed G / G allel marker and G / A with the highest frequency in 18 cases for resistant grou conclusion: These findings showed that polymorphism TNF alpha (308G> A) with allele G/AandG/G had a significant relationship with the development of factor VIII inhibitor in hemophilia A in the resistant group in hemophilia patients A.

Keywords: Hemophilia A, TNFα, Inhibitor, Polymorphism

P25

Evaluation of Trace Element Concentration in Packed Red Blood Cell (PRBC) Product during Storage in Blood Bank Condition

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Background: Packed red blood cell (PRBC) has undergone a number of biochemical, functional and morphological changes during storage that can decrease survival, function and quality of this product so-called red blood cell storage lesion. This study investigates the concentration of some trace elements during red blood cell storage. Method In this study, we used 8 PRBC bags and sampling was carried out on days zero (The day of PRBC preparation), days 2, 7, 14, 21, 28, 35 and day 42. The concentration of some trace elements including; Manganese, Zinc, Copper, Selenium, Magnesium, Iron, Calcium, Phosphorus, Sodium and Potassium were measured. Results The results showed that the concentration of Ca, Phos, Fe, Mg and K increased during red blood cell storage while Na concentration was significantly decreased during storage. The concentration of Mn, Zn, Cu and Se did not show a significant change during storage up to 42 days. Discussion High concentration of potassium, magnesium and Iron can cause serious complications after blood transfusion in the recipient. It seems to prevent these effects until the levels of these elements reach their maximum that is before the third week of storage the red blood cell should be consume and transfused.

Keywords: Trace Elements, Packed Red Blood Cell, Red Blood Cell Storage

New Trends in the Diagnosis of Inborn Errors Metabolic P26 - P27

P26

Assea Floetida Antidiabetic Effect on Glute4 Expresion in Mouse c2c12 Cell

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Introduction: Hydro-alcoholic extract of Assea feotida resin ind Hydro-alcoholic extract of Angus resin indicates polyphenol and antioxidant activity.material and methods: Mice mycoblast C2C12 cells were cultured and added appropriate amounts of assea feotida to the test wells and incubation was performed. MTT solution was added to each well in a CO2 incubator and read absorbance. Percentage of live cells were counted and compared with control group. The concentration of lysed cell protein was determined by Bradford reagent and the appropriate amount of lysed cell protein was separated by SDS-PAGE gel. Then transferred to nitrocellulose paper. The images were taken by Gel documentation and data were analyzed. Discussion: Polyphenolic content was significant correlated with antioxidant activity ($p<0.05$). assea feotida caused increasing the translocation of GLUT4 from the cytoplasm to the plasma membrane. Results: The results of this study indicated that the assea feotida plant can act as an anti-diabetic agent by increasing insulin sensitivity in muscle cells and it is clear that C2C12 cell is a specific molecular marker in molecular analyses.

Keywords: Assea Feotida, C2C12 cell, Insulin, Glute4 Transporter, Phenolic Compounds

P27

Evaluation of G6PDH Deficiency Incidence in Urmia

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Background: Glucose-6- phosphate dehydrogenase (G6PDH) is the main glycolytic enzyme in the mammalian cells which is abundant in RBCs, WBCs, platelets, lactating mammary glands and adrenal. Glucose-6- phosphate dehydrogenase deficiency is the most common hereditary RBC enzymopathy resulting in hemolysis. Anti-malaria drugs such as primakin, pentakin and pamakin, infections and favism may lead to hemolytic crises, as well. This study was aimed to investigate the prevalence of G6PDH deficiency in Urmia. Methods The current investigation is across-sectional study carried out semi-quantitatively using G6PDH kit (Sigma-Aldrich Co.). Furthermore, hematologic indices including HCT, Hb, RBC count, MCV, MCH & MCHC were measured. Cluster and random plasma-EDTA samples were taken from 200 individuals (91 females& 101males, 2-64 years aged). Results Two individuals including a female in 10-20 years group age and a male in 50-60 years group age showed G6PDH deficiency, who had a father-daughter relationship. The hematologic indices were in normal ranges in all samples. Conclusion Our results indicated that almost 1% of Urmia citizens (6679 people) suffer from G6PDH deficiency according to the last census performed in 1390 which revealed that the population of Urmia was 667499 people. However, other methods with improved specificity and sensitivity may show higher percentage of affected individuals.

Keywords: G6PDH Deficiency, Incidence, Urmia

Non-Communicable Diseases (Autoimmune Diseases and Diabetes) P28 - P40

P28

The Association between Insulin Treatment in Diabetes Type 2 and LDL-Cholesterol Ratio

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Introduction: Diabetes is a known metabolism disease, and relatively common in Iran. Diabetes type2 is a kind of disordering in body metabolism that it identifies by increasing blood glucose because of insulin low level or insulin resistance. One of reason for increasing mortality is coronary artery disease as the result of diabetes. Patients with type 2 diabetes feature important modification of low density lipoprotein (LDL) which is likely to play an important role in the development of atherosclerosis. Important qualitative abnormalities of LDLs, potentially atherogenic, are observed in type 2 diabetic patients. increase level of LDL in Diabetes patients. Our study aimed to evaluate the possible association between insulin treatment in diabetes type 2 and LDL-cholesterol ratio. Materials and Methods: In this case-control study we enrolled 36 insulin-treated type 2 diabetes patients and 110 patients that were chosen as a control who were using another methods. Results: Our study indicated effectively that the amount of LDL level in Diabetes patients who were treated by insulin compared with control group was effectively decreased. While it had not seen the important difference between amount of HDL level.

Keywords: Diabetes Mellitus Type 2, High-Density Lipoprotein, Low-Density Lipoprotein, Insulin Treatment

P29

Developments in Diagnostic Testing and Interpretation of Laboratory Tests for Systemic Lupus Erythematosus

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Bakground: Autoimmune is the state of immune system over activity, when the immune system of body attacks and damages its own tissues.The prevalence of autoimmune diseases is on a steady increase. Over the last 10 years, our ability to detect and quantify the antibodies involved in autoimmune diseases has improved. Systemic Lupus Erythematosus (SLE) is an autoimmune disease that can involve many different organs. diagnosis of SLE is based on characteristic clinical findings as well as on serological parameters.Laboratory testing is of valuable method to evaluating a patient with a suspected SLE.These tests are used for diagnosis, estimate disease severity, aid in assessing prognosis and to follow disease activity.In this review paper we intend to present some of modern routine and partly specific laboratory tests for SLE.we alse mention the differential diagnosis of SLE and other similar diseases. Conclusion: Usually the clinical manifestations of systemic lupus erythematosus (S.L.E.) are extremely varied, there are several tests and methods for diagnosis of this diseases which is mentioned in this paper. Findings show some variations between patients but generally involves the presence of self-reactive autoantibodies and inflammation.Typically, multiple laboratory tests are needed for confirm diagnosis.

Keywords: Autoimmune Disease, Laboratory, Serologies, SLE

P30

Investigating the Correlation between HbA1c Dyslipidemia and Liver Enzymes in Healthy, Pre-Diabetic, Diabetic and Uncontrolled Diabetic Individuals

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Background: Diabetes mellitus (DM) characterized by chronic hyperglycemia, contributes to high risk of metabolic disorders. Glycemic hemoglobin (HbA1c) reflects average plasma glucose over the previous 8– 12 weeks. The liver plays an important role in maintaining glucose homeostasis. We investigated the relationship between HbA1c, serum lipid profiles, and liver enzymes in healthy, pre-diabetic, diabetic and uncontrolled diabetic individuals Methods: 300 controls with HbA1c lower than 5.7%, 300 prediabetic (HbA1c from 5.7 to 6.4%), 300 type 2 diabetic (HbA1c >6.5% and 300 uncontrolled diabetic (HbA1c >8%), were studied The sera were analyzed for fasting blood sugar (FBS), high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C), total cholesterol (TC), triglycerides (TGs) alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), lactate dehydrogenase (LDH), γ-glutamyltransferase (GGT), Then were analyzed by SPSS. Results: Results showed significantly lower levels of HDL and Significantly higher levels of TC, TG and LDL FBS GGT and ALT in diabetic and uncontrolled diabetic compared to healthy and pre-diabetic individuals ($p<0.05$) but significant increases were not seen with (AST) ALP LDH. A Significant increase in TC and LDL-C were seen between the diabetic and uncontrolled diabetic patient ($p<0.01$). Conclusion: Our results indicated significant increases in lipid parameters, ALT, GGT with increasing HbA1c in diabetic and uncontrolled diabetic so HbA1c can be used as a good parameter for predicting dyslipidemia. Diabetic patients should do routine monitoring of blood glucose and serum lipid profiles because controlling blood sugar at early stages can reduce the risk of metabolic diseases.

Keywords: Diabetes Mellitus, HbA1c, Serum Lipid Profiles, Dyslipidemia, Liver Enzymes

P31

Effect of Hydatid Cyst Fluid Antigens on PC-3 Human Prostate Cancer Cell Line

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Background: Cancer is one of the most important human health problems as a result of abnormal cell proliferation in the body. Previous studies have shown that parasitic infections may induce antitumor activity against certain types of cancer. In this study, we investigated the anticancer effect of hydatid cyst fluid (HCF) of Echinococcus granulosus on prostate cancer PC-3 cell line through induction of apoptosis pathway. Methods: Hydatid cysts were collected from the livers and lungs of infected sheep from Babol slaughterhouse and examined for fertility. The HCF was aspirated and collected from fertile cysts. The total protein concentrationof HCF was determined using the commercially available bicinchoninic acid (BCA) assay. The PC-3 cells were treated with different concentrations of HCF protein and evaluated for induction of apoptosis by flow cytometry using Annexin V-FITC/ PI staining. Results: In comparison to none-treated cells, the HCF significantly induced apoptosis in treated cells. The HCF proteins in concentration of 500 µg/ml induced 80% apoptosis in the PC-3 cell line. Conclusion: The results of this study showed that the HCF proteins could induce apoptosis in PC-3 human prostate cancer cell line. Further in vivo studies on anticancer effect of this parasite are required to indicate its efficacy along with other agents for the treatment of prostate cancer.

Keywords: Hydatid Cyst Fluid (HCF), Prostate Cancer, Apoptosis

P32

Prevalence of Vaginal Candidiasis in Women Referring to Healthcare Centers and Emam Ali Hospital of Zahedan Province, in 2016

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Background and Objectives: Vaginal candidiasis is an infection caused by Candida species that affects millions of women each year. Although Candida albicans is the major cause of infection, identification of non-Candida albicans species, especially Candida glabrata as a cause of vaginal candidiasis is necessary. The aim of this study was to identify and evaluate vaginal candidiasis in order to propose appropriate strategies for prevention and treatment. Methods: This study was a descriptive cross-sectional study performed on 149 women referred to Healthcare Centers and Emam Ali Hospital of Zahedan Province. Vaginal discharge was collected by two wet cotton swabs. At first, the specimens were examined by direct method and then were cultured on Sabouraud's dextrose agar, corn meal agar and CHROM agar for species identification. The data were analyzed using SPSS 11 software. Results: Out of 149 specimens, 20 cases (13.4%) of Candida species were identified. 14 cases (70%) Candida albicans, 1 cases (5%) Candida tropicalis, 2 cases (10%) Candida cruzi and 3 cases (15%) Candida glabrata was identified. Conclusion: Vaginal candidiasis is the second most common infection after bacterial vaginal infections in women. About 20% of women normally have candidiasis in the vagina. Candida can multiply and cause infection if the vaginal environment changes due to hormones and medications.

Keywords: Prevalence, Vaginal Candidiasis, Candida Albicans, Women

P33

Acute Lymphoblastic Leukemia Incidence and Relation to Seasonal Variation

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Background: Acute lymphoblastic leukemia (ALL) is a hematologic malignancy characterized by the proliferation and accumulation of lymphoid precursor cells in the bone marrow and other tissues. Although ALL accounts for only 20% of adult leukemia, it is the most common acute leukemia in children (80% of cases). If seasonal variation occurs at the onset of ALL, an etiology for exposure to infection can be supported. Materials and Methodes: The data obtained of new cases ALL patients (n = 424; Male: 243; Fimale: 181) admitted to Shahid Baqaei (2) Ahwaz hospital during 1393-1397 were studied and seasonal outbreak were evaluated in this study. Result: Results showed that referral rate of patients with ALL was 18.8% (n=80) in spring, 24.5% (n=104) in summer, 26.4% (n=112) in autumn and 30.1% (n=128) in winter and the highest and lowest referrals were in December-January and May-June, respectively. Canclusion: According to the results, most cases of ALL were seen in the cold seasons (autumn and winter).a sudden decrease in temperature, an increase in the prevalence of colds and influenza, air inversion phenomenon and followed by an increase in contamination and the arrival of dust and Soil may be effective in these results. However; more evaluation with a further datas are needed.

Keywords: Acute Lymphoblastic Leukemia, Seasonal Variation, Winter

P34

Comparison of Level Serum Copper, Zinc and Magnesium between Patients with Type 2 Diabetes and Control Subjects

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Background and objective: Disturbance of Mineral metabolism can be related to some metabolic diseases such as diabetes. The aim of this study is the compare of level serum copper, zinc and magnesium between patients with type 2 diabetes and control subjects. Material and methods: In this case-control study, 30 patients with type 2 diabetes referred to the Zahedan hospital and 30 healthy individuals were selected. A fasting blood sample was individually measured for fasting blood sugar and Cu, Zn, Mn measurement. The data were analyzed by using SPSS 19 and independent student t test. P values less than 0.05 were considered statistically significant. Result: the result of study showed that mean level serum of zinc and magnesium in patients with type 2 diabetes were lower than control healthy and the difference in mean level serum of zinc and magnesium between two groups was statistically significant ($p<0.05$) .there are no mark difference in serum of Cupper between two groups ($p>0.05$). Conclusion: Investigation of dietary minerals and their effects on diabetes requires interventional studies and further studies.

Keywords: Diabetic Patients, Magnesium, Copper, Zinc

P35

Association between Polymorphisms of rs157580 and rs8106922 of TOMM40 Gene in Patients with Late Onset Alzheimer's Disease

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Introduction: Alzheimer's disease is the most common type of "dementia" in aging. Its incidence increases with aging and is associated with brain attrition and focal neurological degeneration, especially in hippocampus and the forehead. Alzheimer is classified according to its onset: early onset (less than 65 years) and late onset (over 65 years) type. Alzheimer is a multifactorial disease that both genetic and environmental factors contribute to its demographic distribution. Genetic background, age, sex and nutrition are among the main risk factors for onset and spread of this disease. TOMM40 gene is located in 13q 19 area, which is about 15 kilobase closer to APOE gene. Genetic polymorphisms rs157580, and rs8106922 at TOMM40 with late onset risk were investigated in this study. Materials and Method: In this case-control study, blood test were taken from 117 patients and 130 control. DNA was extracted by Salting out /Proteinase k method and examined by ARMS-PCR method. Results: DNA was extracted from blood samples of controls and patients, and their absorption (OD) were determined. The PCR conditions for each polymorphisms were adjusted, then PCR was performed for all patient and control samples. PCR product was electrophoresed on10% polyacrylamide gel. Conclusion: The results of two groups of patients and control were compared to determine whether there was significant difference between them.

Keywords: Alzheimer's Disease, Polymorphism, Mutation, PCR, TOMM40 Gene

P36

Comparison of Diurnal Variations in Serum TSH Levels in Patients Referred to Imam Ali Laboratory of Imam Ali Hospital of Andimeshk

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Introduction & Objective: TSH is one of the most requesting tests in clinical laboratories to screen, diagnose, or treatment follow-up Due to the many variations inthis test due to various factors, including due to diurnal variations, it poses many challenges for physicians and laboratories. It is important to show the difference in test results at different times. Material & Methods: The study, was conducted in laboratory of Imam Ali Hospital in Andimeshk from May to end of September 2019.Patients were sampled once in fasting condition at 8-9 am and again at 5-6 pm. Tests were performed weekly using Autobio TSH kit and ELISA method using CW Fusion. Then the results of the two methods were compared using the t-test. Results: Of the 515 patients referred to the laboratory, 67 were diagnosed with disturbance in thyroid panel tests that were excluded from the study. Of the 448 patients who had normal thyroid panel tests, 256 also referred in the evening for sampling. The patients that had normal thyroid panel tests, their serum TSH levels were compared in the morning and evening. Mean serum levels of TSH in morning and evening time were 2.26 ± 0.81 and 1.87 ± 0.76, respectively, which was statistically significant ($0.00001>p$). Conclusion: Serum TSH levels in the morning are significantly higher than in the evening sample, and as the reference range of the tests are often determined by the morning sample, it is therefore recommended to perform this test in the morning to better assess the patient's condition.

Keywords: TSH, Diurnal Variations, Elisa

P37

The Effect of Vitamin D Deficiency on the Level of Anti-Nuclear Antibodies (ANA)

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Introduction: The active form of vitamin D (calcitriol) is a powerful regulator of the immune system and can suppress inflammatory responses. Vitamin D modulates innate and acquired immune responses, and it's deficiency can be associated with a variety of autoimmune diseases. Many cells of immune system have vitamin D receptors, and vitamin D deficiency may disrupt immune system regulation and cause to product autoimmune antibodies, especially anti-nuclear antibodies (ANA). The aim of this study was to investigation of the effect of vitamin D deficiency on the level of ANA production. Method: In this study, vitamin D levels were assessed by High-Performance Liquid Chromatography (HPLC) in two groups including 200 healthy persons and 200 abnormal ANA persons by immune-fluorescent (IF) method. Data were analyzed by GraphPad Prism 8 software. Results: The results of vitamin D test from both positive and negative ANA groups showed that there was a significant relationship between vitamin D deficiency and increased ANA level (p value= 0.002). Discussion & Conclusion: This study confirmed the significant relationship between vitamin D deficiency and increased level of anti-nuclear antibodies. In future studies, it is recommended to investigate the effect of vitamin D treatment on inflammatory response.

Keywords: Anti-Nuclear Antibody, Vitamin D, Autoimmune, ANA Test

P38

Assessing The Effect of Implementation of Discharge Plan on Saliva Cortisol Level in Patients with Diabetes Mellitus

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Background: Anxiety is one of the major problems of patients with diabetes mellitus at the time of discharge from hospital. People get anxious because of being in new positions and Lack of sufficient awareness of their diseases. This study aimed to evaluate the effect of implementation of discharge plan on saliva cortisol (an indicator of anxiety) in patients with diabetes mellitus. Methods: This pretest-posttest randomized clinical trial was conducted on eighty patients discharged from hospital. Patients were randomly allocated to control and intervention groups. Saliva samples were taken in 2 stages. First saliva samples were taken to measure the cortisol levels half an hour after informing the patients about the discharge order. After this step, control group received routine discharge information by nursing staff and then saliva samples were taken after half an hour. The patients in the intervention group were provided with a discharge plan consisting of face to face education and an educational booklet. Saliva samples were taken for cortisol level measurements, half an hour after providing the discharge plan for these patients. Descriptive and inferential statistics via the SPSS software v. 25 was used for data analysis. Results: The average of saliva cortisol levels in the intervention group decreased during intervention (8.82 to 4.74 mic/dL). There was no significant change (9.90 to 9.69 mic/dL) in the control group. There are significant differences between two groups ($P<0.001$). Conclusion: Provision of discharge plan can reduce discharge anxiety among patients with diabetes mellitus, that should be discharged from hospital.

Keywords: Cortisol, Saliva, Diabetes Mellitus

P39

Investigating the Interferon Regulatory Factor 3 (IRF3) Expression in Multiple Sclerosis Patients in Comparison with Control Group in the Iranian Population

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Background: Relapsing-remitting (RRMS) is the most common course of multiple sclerosis. Interferon Regulatory Factor 3 (IRF3) as a key regulator of immune system genes plays an important role in activating type I interferon promoters, especially the IFNβ promoter. We therefore aimed to evaluate the expression level of IRF3 in RRMS patients undergoing different types of IFNβ treatment. Methods: We collected 100 venous blood sample from normal and patients. We grouped samples in 4 separately groups by their illness status. To evaluate the expression of IRF3 the Real-Time PCR method using SYBR Green dye was done. The level of gene expression was measured by a comparative threshold cycle formula. Results: In the study we compared the IRF3 mRNA expression of all subjects in association with gender, which no significant difference was seen ($P > 0.05$). Also assessment of the gene mRNA level in study groups revealed that the B1b, B1a and new case group had the lowest expression respectively. Moreover, comparison of the mRNA level between new case and B1b groups showed remarkable difference ($P < 0.05$). According to age and sex factors, no remarkable differences between study groups were seen ($P > 0.05$). Conclusion: Perhaps the IFNβ recombinants decreases the IRF3 expression as a negative feedback mechanism. Overall the data reported here, supports the previous studies in important role of IRF3 in autoimmune inflammatory disease of CNS and Multiple Sclerosis.

Keywords: Multiple Sclerosis, IRF3, IFNβ

P40

The Circulating Midkine in Celiac Disease: Clinical Implications

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Background: Celiac disease (CD) is a chronic inflammatory small intestine disorder caused by an abnormal immune response to an array of epitopes of wheat gluten and related proteins of rye and barley in genetically susceptible individuals. Midkine (MK) is an angiogenic cytokine, chemotactic in the direction of polymorphonuclear neutrophils and macrophages, and a T-regulatory cell suppressor, and a possible relationship with CD has not yet been explored. The most reliable method to diagnose CD is taking the samples biopsy. The serological tests are milestone for screening of CD diagnosis. The objective of this study was to measure the circulating MK in the celiac patients and healthy individuals (controls). Methods: The Enzyme-linked immunosorbent assay (ELISA) was used to measure the circulating MK in the celiac patients and controls. Results: There was insignificant difference in the circulating MK between the patients and controls ($P>0.05$). Conclusion: The study results suggest that the MK performance as a “ruling out” marker does not have the diagnostic value in CD or follow-ups.

Keywords: Celiac Disease, Midkine, Enzyme-Linked Immunosorbent Assay, Inflammation, Tissue Transglutaminase

Plts and Thrombosis

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P41

Deep Vein Thrombosis: A Less Noticed Complication in Hematologic Malignancies and Immunologic Disorders

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Background: Deep vein thrombosis (DVT) is a common complication in hematologic malignancies and immunologic disorders that coagulation and inflammatory factors play a crucial role in its occurrence. Methods: The content used in this article has been obtained by the PubMed database and the Google Scholar search engine of English-language articles (1980–2019). Results: Increased levels of coagulation factors, the presence of genetic disorders, or the use of thrombotic drugs that stimulate coagulation processes are risk factors for the development of DVT in patients with hematologic malignancies. Inflammatory and auto-anti-inflammatory factors, along with coagulant factors, play an essential role in the formation of venous thrombosis in patients with immunological disorders by increasing the recruitment of inflammatory cells and adhesion molecules. Therefore, anti-coagulants in hematologic malignancies and immunosuppressants in immune disorders can reduce the risk of developing DVT by reducing thrombotic and inflammatory activity. Conclusion: Considering the increased risk of DVT due to impaired coagulation and inflammation processes, analysis of coagulation and inflammatory factors have prognostic values in patients with immunologic deficiencies and hematologic malignancies. Evaluation of these factors as diagnostic and prognostic biomarkers in the prediction of thrombotic events could be beneficial in implementing effective treatment strategies for DVT.

Keywords: Venous Thromboembolism, Deep Vein Thrombosis, Hematological Malignancies, Immunologic Disorders, Treatment.

P42

Platelet Reference Value in Healthy Iranian Subjects Referred to Pars Hospital Laboratory

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Backgrounds: There are racial, ethnic and geographical differences reference values in many laboratory tests, especially in complete blood count (CBC) therefore it is necessary to establish reference values that are population specific. Platelet count is one of the important cells in CBC reports. Proper upper and lower limits of this cell is critical to determination the conditions of health or disease in an individual person. Methods: using the mindray BC6800 cell counter, we measured platelet count in EDTA collected from 199 healthy males and 289 healthy female ages 18-70 years old, referred to Pars Hospital Laboratory over a 3-month period. Patient selection was done rely on exclusion criteria including: Acute and chronic disease, pregnant women, diabetes, history of cardiovascular disease, cancer, using any medications, smokers and alcohol users. Quality control were made daily using R&D quality control in two high and normal levels. Results: Reference values for platelet count ranged between 151-355 ×109 /L and 136-336×109 /L (mean±2SD) in women and men respectively. Mean platelet count was significantly higher in women compared to (p value > 0.05). In previous study on Iranian population, reference value was 145-356×109 /L without mentioned difference according to the sex. Conclusion: In present study, determination of reference values of platelet in Iranians were found to be different from national and international data; they were a little lower than those in references. More reliable reference value according to the population and gender is a valuable data for determine the condition of the disease and health.

Keywords: Platelet, Mindray BC6800, Iranian Population, Reference Value

P43

Effects of Medicinal Herbs Including Thyme, Alfalfa, Punehi, Horsetail, and Yarrow on Blood Coagulation in-Vitro

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Introduction: Blood coagulation system maintains the vascular system integrity after tissue damage and prevents bleeding. Some of the medicinal herbs have been used for bleeding control. Here we investigated the effects of above mentioned medicinal plants on the blood coagulation in-vitro. Materials and Methods: Plan extracts was obtained by Maceration method and dissolved in PBS. Extracts in different concentrations (25, 50, 100 mg/mL) were mixed with normal pooled plasma in 1:5 ratio, and then incubated at room temperature for 5 minutes. Thrombin Time (PT) and Activated Partial Thrombin Time (APTT) tests were performed immediately by an automated coagulometer. Statistical analysis was performed using SPSS software. Results: According to the results, Alfalfa extract induced coagulation process and decreased PT significantly ($P < 0.05$). On the other hand, Thyme, Yarrow and Punea extracts at 25 and 50 mg /mL reduced PT time but increased it at 100 mg/mL ($P < 0.05$). PT time was also increased by Horsetail in a dose dependent manner ($P < 0.05$). Interesting, Thyme, Alfalfa and Punehi inhibited the coagulation process and increased APTT in a dose-dependent manner. In contrast, Yarrow extract decreased it in all concentrations ($P<0.05$). Interestingly, Horsetail strongly inhibited the coagulation and therefore increased APTT ($P<0.05$). Discussion and Conclusion: We found dose-dependent effects for most of the extracts. Therefore, their effects might be stronger by increasing the concentration. Extracts might exert their inhibitory or inductive effects by affecting the coagulation factors. Further studies are required to clarify the mechanism of the effect of extracts on the coagulation system.

Keywords: Medicinal Herbs, Coagulation, PT, APTT

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The Positive Effects of Two Endogenous and Exogenous Antioxidant Agents for Protection of Platelet Concentrates from the Storage Lesions

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Background: The platelet storage lesions (PSL) are the main challenge to increasing the shelf life of platelet concentrates (PC). In current study, the effects of two endogenous and exogenous antioxidants, L-Carnitine (LC) and N-acetyl-cysteine (NAC), were evaluated on the PC stored at day 3 and 5 in blood bank condition. The quality of PC was evaluated before and after treatment by two antioxidants. Methods: The effects of optimized LC (15mM) and NAC (1mM) on platelet quality were assessed by analyzing the levels of glucose, lactate, ATP and LDH activity. Platelet aggregation induced by arachidonate and ristocetin was analyzed at aforementioned days by aggregometer. Platelet viability was measured by MTT assay and platelets' count and volume were determined by a hematology analyzer. Results: Lactate concentration and glucose consumption significantly decreased in both of LC and NAC treated platelets on day 3 of storage. LDH activity was less increased in both treated PC on day 3 and 5 of storage. Platelet aggregation in response to the ristocetin and arachidonate was significantly higher in LC-treated PC on day 3, 5 of storage, but it didn't occur for the NAC-treated platelets. Platelet viability was significantly increased in both treated PC on day 3 and 5 of storage. Conclusion: Results showed that LC better than NAC could affect positively on PC viability and its function.

Keywords: L-Carnitine, N-acetyl-Cysteine, Platelet Quality, Platelet Storage Lesion

P45

Heparin Therapy Interfere with Immunoturbidimetric Test of Antithrombin III

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The pre-analytical phase is the phase where the laboratory has no direct control on the process. Pre-analytical factors that can affect results include: sample type, sampling time, sample handing, patients preparation and the nutritional status of the patient. The laboratory testing process is divided into pre-analytical, analytical and post-analytical. For obtaining reliable results, the prevention and detection of errors at all steps is required. Correct practices and strategies of error prevention can reduce pre-analytical errors.

Keywords: Pre-Analytical Error, Errors, Laboratory Tests, Sample, Patient

P46

Guidelines for Preparing Peripheral Blood Smear (PBS) Indications and the Screening Criteria for Their Evaluation

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One of the challenges in the hematology departments of clinical laboratories is for which CBC with differential, peripheral blood smear is required for evaluation and verification based on the results of cell counters. In general, these indications are not among the routine procedures in which clinicians request examination of the patient's blood smear. Another important challenge after selecting and preparing PBS from the patient's CBC is definitely determining the purpose, strategy, and the necessary evaluation of the patient's peripheral blood smear. Therefore, two significant concerns should be addressed before compiling any guidelines for patients' CBC samples in hematology department of laboratories: (1) Peripheral Blood Smear should be collected from which CBC samples and (2) the what the purpose and applied strategy for selecting the sample is, and which abnormalities after evaluation of PBS should be confirmed or rejected by the hematologist. If the clinical laboratory uses partial differentiation for mixed populations, it is recommended to prepare blood smear for values > 10% of CBC with differential. Then, the confirmed results based on PBS should be reported to the treating physician and CBC with differential results must never be reported by MXD% values. Laboratories that use partial blood counts or CBC are recommended to prepare Pripheral Blood Film (PBF) by scrutinizing reference tables to check blood indices according to both sexes and different ages. If the reference values are out of range according to the age and sex of the patient -cases of leukocytosis, leukopenia, neutrophilia, neutropenia, lymphocytosis (Differentiation between atypical from reactive lymphocytosis), lymphopenia- the generated histograms in hematology cell counter does not conform to the normal pattern. For example, T1 valley-free histogram represents presence of blast, high level of monocytosis, malignancies, reactive lymphocytes (Variant or atypical). T2 valley histogram shows presence of blast, high level of monocytosis, malignancies, eosinophilia, and neutrophil left-shift. Other examples are WBC histogram in the form of a "WL flag" with a non-ground beginning point that does not start from the baseline which shows RBC, Plt aggregation, giant Plt, NRBC resistant to lysis, and schistocytes. A gray cytogram should be checked for NRBC, blood parasites, lysis resistance, cell zone disruption, and any type of unknown cell. RBC histograms with left, right, two or three peaks and any flag at the border of RBC and platelet are definitely indications for PBS examination. Any wide RBC histogram and platelet histogram with right end above 10% of baseline or the bottom is also another indication for PBS examination. In general, it is recommended not to change cell counter operators in the laboratories so that the experienced operators would be more heedful and meticulous in recognizing the pattern of CBC outcomes in patients. To facilitate the use of the above tables, a summary table can be prepared in which abnormal and out-of-range values of hematological parameters and indices are specified, and the clinician in hematology department can easily refer to the table in order to prepare patients' peripheral blood smears. Finally, it is recommended to prepare similar samples of tables as "Guidelines of PBS preparation indications and screening criteria" and to place them in the hematology department of each laboratory for personnel use. Also, after examining the patient's PBF or PBS, the report should be prepared as the haematology patient leaflets and sent to the treating physician.

Keywords: PBS, CBC with Differential, Hematology

POCT

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Study of Association between Type of Urinary Tract Stones and Patients Demographic Factors in Patients Referred to Therapeutic Centers in Ardebil

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Background: Urinary stones are the tertiary common problem of urinary system. Calcium stones were common in males. This disease could be caused to renal failure. The aim of this study is determine the association between compounding several types of urinary stones with demographics factors of patients with urinary stone that referred to Ardabil therapeutic centers. Methods:In a cross-sectional and descriptive analytical study on patients with urinary stone, association between type of urinary tract stones and patients demographic factors (age, gender, body mass index (BMI), Job, Habitation place) was studied .150 patients enrolled in to the study. data analyzed with SPSS v 16. One-Way ANOVA & Chi- square used. the descriptive findings were reported as mean + SD and frequency (%). The level of meaningfulness was considered as $P<0.05$. Results: Mean age of patients was 41.90 ± 14.41 year. 91 of patients (60.66%) were male.116 of patients (77.3%) had calcium oxalate stone, 15 of patients (10%) had phosphate calcium stone, 10 of patients (6.7%) had Acid uric and 9 of patients (6%) had phosphate ammonium stone. Significantly difference was not found between type of stone with patients job (P=0.252), habitation place (P=0.173), post medical history (P=0.207) and drug history (P=0.247). Conclusion: Most common urinary stone types in male and female was calcium oxalate (77.3%) and 6% of them was phosphate ammonium.

Keywords: Urinary Track Stone, Urinary System, Demographic Factor

P48

Evaluation of Salivary Levels of Interleukin-6 in Patients with Recurrent Aphthous Stomatitis

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Introduction: Recurrent aphthous stomatitis (RAS) is one of the most common oral ulcers that despite a variety of etiologic factors. The association of biomarkers such as IL-6 with inflammatory diseases has been demonstrated. Measuring the concentration of biomarkers has been useful in the diagnosis and prevention of many diseases. The aim of this study was to measure the salivary concentration of IL-6 in patients with RAS and compare it with healthy controls. Material & Method: 30 patients with recurrent aphthous stomatitis (RAS) who had no history of systemic disease, smoking, dry mouth, radiotherapy, and chemotherapy were enrolled. All participants were provided with consent to participate in the study. Their age and gender was adjusted with control group. Morning saliva was taken from all of them. The concentration of IL-6 was measured using ELISA method based on the protocol of its manufacture. Results: In this study, 30 patients with RAS with age average within 29.06 ± 15.72 and 30 healthy subjects with age average within 26.33 ± 12.67 participated. Mean and standard deviation of interleukin-6 salivary level in patients with recurrent aphthous ulcer was 18.00 ± 21.38 and in healthy subjects was 4.96 ± 3.57 which showed a significant difference according to Mann-Whitney U test. (P <0/001) Conclusion: According to the present study, salivary IL-6 concentrations were higher in patients with recurrent aphthous ulcers than in healthy controls. Given that this biomarker also increases in inflammatory diseases, autoimmunity, cancer and precancerous lesions relation between IL-6 and RAS may be supported.

Keywords: Saliva, Interleukin 6, Recurrent Aphthous Stomatitis

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Evaluation of Oxidative Stress in Type 2 Diabetic Patients and Its Association with Serum Levels of Chromium and Selenium

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Background and aims: Oxidative stress caused by the increase in glucose causes an imbalance between oxidants and antioxidants. Trivalent chromium enters the active compounds of the glucose tolerance factor which can enhance insulin action and selenium acts as an antioxidant to prevent excessive production of toxic free radicals or reduce their effects and damage. This study aimed to investigate oxidative stress induced by diabetes and its association antioxidant with serum levels of chromium and selenium. Materials and Methods: Thirty diabetic patients and 25 healthy individuals participated in this study. Oxidative stress, glutathione (GSH) and glutathione peroxidase (GPx) indices were measured with specific kits. Chromium and selenium were measured by atomic absorption spectrometry. The results were analyzed by SPSS software (version 19). Correlations between factors were assessed using the Pearson test. P <0.05 was considered significant. Results: (GSH) and (GPx) in diabetic patients compared to healthy subjects was lower. The amount of chromium and selenium compared to those of healthy people showed significantly lower levels. Conclusion: Oxidative stress indices were significantly different in type 2 diabetic and healthy controls and chromium and selenium levels were lower in diabetic patients. It can be concluded that the deficiency of chromium and selenium, which are antioxidants, affects the oxidative stress indices. Therefore, appropriate therapeutic modalities play an important role in enhancing antioxidant defense.

Keywords: Diabetes, Oxidative Stress, Chromium, Selenium

P50

Study of APO-A1 and APO-B Serum Levels in Pregnant Women Comparing the Non- Pregnant Control Group

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Background: It has been shown that lipid profile changes during pregnancy. Apolipoproteins are plasma proteins binding non-covalently to hydrophobic lipids making them soluble to be transported in the circulatory system. This study was designated to investigate the pregnancy complications such as unnatural hemorrhage, preeclampsia and eclampsia as well as their relationship with serum levels of Apo-A1 and Apo-B. Methods: Serum levels of Apo-A1 and Apo-B (pars azmoon kit) were measured in 45 pregnant women (without pregnancy complications), 35 pregnant women (with pregnancy complications) and 35 non pregnant women in the same age group (18-49 years old). Then these three groups were compared together in serum level alterations of Apo-A1 and Apo-B. Results: There was no significant increase in serum levels of Apo-A1 in the healthy pregnant women (170.7 mg/dl), compared to pregnant with pregnancy complications (201.3 mg/dl) and compared to control group (165.2 mg/dl ; P>0.0.5). In comparison with the control group there was a significant increase in Apo-A1 levels in unhealthy pregnant individuals (P<0.05). Furthermore, Apo-B levels showed a significant increase in pregnant women (both groups) comparing with the control. Conclusion: We observed a positive correlation between Apo-A1 and Apo-B levels in pregnant individuals and control group; however, it was only significant in healthy pregnant women. Higher levels of Apo-A1 and Apo-B were seen in pregnancy noting that the levels were higher in unhealthy pregnant individuals compared with the control group.

Keywords: Apo-A1, Apo-B, Pregnancy

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P51

Risk Management in Medical Diagnosis Laboratory

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Clinical decision making and patient management are highly dependent on accurate test results. However, errors may occur at all stages of testing and probable errors are an important part of quality management in the laboratory. In the clinical lab, the formal process of risk management is a relatively new approach, and each laboratory must identify and evaluate its risks and prioritize them and be aware of their consequences. Non-conformance in the early stages provides a good opportunity to prevent severe damage to the laboratory. The laboratory should identify, evaluate and manage the risks throughout the testing process. Risk Management Optimizing the Risks and Opportunities for Appropriate Strategy Implementation of Risk Management in the Lab: A) Ensuring that the quality management results are achieved: Risk management equips laboratories to achieve the best balance between traditional quality control and other operational processes where risk exists to minimize risk. B) Error Prevention or Reduction in All Laboratory Processes: The risk management process strives to predict errors in terms of recurrence, probability of injury, and effort to reduce the risk and probability of injury to an acceptable level to achieve recovery. C) Provides appropriate opportunities for the laboratory to achieve its goals.

Keywords: Risk Management, Laboratory

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Sensitivity and Specificity of Immature Granule Flag in Mindray BC-6800

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Background: The mindray BC-6800 is an automated hematology analyzer and 5-part leukocyte differential counter for use in clinical laboratories. This instrument counts immature granulocytes (IGs) and use the Immature gran? (IG) flag to signal unreliable results. This study investigated the usefulness of IG flag and IGs measurement in peripheral blood smear slides. Method: 600 EDTA samples collected from patients admitted to Pars Hospital lab during a month were analyzed by two mindray BC-6800 instruments. The IG count and the Immature gran? flag reports from all two instruments and blood smear were prepared and stained with Wright-Giemsa using the ELITech and total of 100 cells were counted. Results: 90 samples containing band cells were found without IG flag (sensitivity 47%), 80 samples with IG flag containing at least band cells (and then metamyelocyte) (specificity 98%)and there was no immature granule in 6 samples with IG flag. The most significant contributor to the report of the "IGs?" flag was bands and metamyelocytes, and the absence of IGs flag played a minor role in detecting band cell. Conclusion: In the samples containing the band, IG flag was not effective and even in some samples with high percentage of band the flag was absent. But in samples with granulocytic grades including Metamyelocyte, Myelocyte, IG flag was present that matched with peripheral blood smear and cells were counted. Therefore, IG flag is not useful for band detection.

Keywords: Immature Granule Flag, Mindray BC-6800, Sensitivity, Specificity

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Comparison of Performance of Three Control Kits (Pars Azmun, Randox, Persian Tajhiz) for Measurement of Laboratory Biochemical Test

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Background: Quality control in the laboratory means studying and analyzing laboratory errors and diagnostic methods and minimizing errors.The use of commercially available control serum different brands in the biochemistry laboratory in one of the most basic methods of controlling the accuracy and precision of the test results. The purpose of the study was to compare performance of Pars azmun kits on Pars azmun, Persian tajhiz and randox control samples. Methods Ten control serum samples of Pars azmun, Persian tajhiz, Randox were evaluated three times with Pars azmun kits for biochemical tests using Japanese Biolysis 24i in Endocrinology and Metabolism Research Institute of Iran University of Medical Sciences. Results There is an essential difference among 3 control kits in FBS, Bil D, Bil T, AST,ALT ,UA, Alk(pv=0.001),Calcium by pars azmun control and Persian(pv=0.164),pars azmun and randox (pv=0.462) in TG (pv =0.464) and Chol (0.006) , Alb (pv=1) among 2 controls pars azmun and randox and Cr kit ,there isn't an important difference in Phosphor between pars azmoon and Persian (pv=0.052) Conclusion Considering the cost of choosing the right diagnostic control where in accuracy and validity would have existed and with tested kit and give correct answers one of the most basic choices in the biochemistry lab.

Keywords: Control, Pars Azmun, Persian Tajhiz, Randox, Biochemical Tests

P54

Evaluation of Lab Biochemical Tests Using Six Sigma Method

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Background: The assessment of laboratory performance is critical to keep accurate laboratory outcomes. Today, the newest kind of quality management is Six Sigma, which examines the quality of all laboratory tests. In this study, we aimed to evaluate the quality of the clinical biochemistry laboratory using six sigma. Methods: This cross-sectional study performed in 5 laboratories over a period of 12 months from December 2018 to December 2019. For 13 biochemistry analytes, the CV was calculated for normal level of IQC and bias from EQAS. Then sigma values were calculated using CV%, bias% and TEa (from Clinical Laboratories Improvement Act (CLIA) guidelines). After holding training courses and monthly audits, the sigma scale of all tests was recalculated and the results were compared. Results: In the initial evaluation of 5 laboratories, sigma values > 6 were observed for ALP and/or ALT analytes. After continuous training and evaluation, analytes with Sigma > 6 at center 1 (TG, ALP, ALT, AST, Uric acid, Fe, HDL, ALB), center 2 (ALT, AST, ALP, TG, Uric acid, Ca), Center 3 (ALT, ALP, TG, Ca, Uric acid, HDL, Fe), Center 4 (ALP, ALT, AST, Ca, Fe, HDL, Cholesterol, TG) and Center 5 (TG, AST, ALT, ALP) were obtained. Conclusion: In this study, continuous training and evaluation of laboratories by using Six Sigma as a quantitative quality assessment tool improved the quality of laboratory services. This was in line with the increased satisfaction of patients, physicians, and the saving of organization resources.

Keywords: Laboratory, Six Sigma, Analyte, Biochemistry

P55

Optimization of Graphic Displays of Automated Cell Counters in Clinical Hematology Laboratory Reports with Provided Blood Cell Histograms

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Background: Complete blood count (CBC) gives information on patients' blood cells and is one of the most frequently requested tests in clinical laboratories. Blood cell histograms are produced by the modern automated hematology analyzers which are routinely used to count blood cells. If those interpreted well, has significant potential to provide diagnostically relevant information. Method: The graphic displays have been compiled over a period of 6 month (March 2019-August 2019) from blood samples (approximately 150 per day) received for routine CBC in the Mehragin clinical laboratory. Those have been analyzed by PTN medical software company. Results: Blood cell histograms transferred to CBC reports as well as another data. So we had a complete report and could interpret results. Histogram interpretation needs careful analysis of RBC, WBC and platelet distribution curves. So very useful comments generated. Conclusion: It is suggested that the laboratories using Blood cell histograms in addition to CBC indexes. A good interpretation of this histogram provides a wealth of information on many hematological conditions than more cell counts, helping to narrow down the differential diagnosis at a very early stage even before higher level investigations are ordered.

Keywords: Complete Blood Count (CBC), Automated Cell Counters, Histograms

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The Rate and Prevention of Errors in Medical Laboratory

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Background: The importance of clinical laboratories works and test results is clearly related to the community health. The problem of medical errors has a great deal of attention. In this study, we focus on this issue to evaluate the variety and rate of pre, during and post-analytical phases errors among staffs, equipment and materials. Methods: In this cross-sectional and descriptive-analytic study in police laboratory centers from 2017 to 2019 (18 months) with inclusion criteria of at least two years of work experience in the laboratory of staffs, the errors were categorized as method of International Organization for Standardization. Results: From total of 15×103 referred patients with 198×103 carried out tests, the total errors were 1.9% & 0.15% in according to patients and tests, respectively. The errors in each phases were as down: pre-analytical 21.5% more in reception section (77%) with duplicate entering of ordered test (35%), during-analytical 37.3% more with human errors (92%) in term of improper diagnosis (26%) and accidental (23%) and post-analytical 41.2% more related to laboratory staff errors (83%) in comparison to result delivery section (17%). The highest errors were in post-analytical phase in about of results typing (38%). In all of abovementioned comparisons, significant differences were observed in data analysis ($P < 0.05$). Conclusion: According to the results, most of the errors in the analytical and post-analytical phases are due to human direct errors. However, more of the errors will be decreased with automation of analytical phase and auto-entering of results to the patient system file.

Keywords: Error, Medical Laboratory, Pre-Analytical, Analytical Phase, Post-Analytical

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