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Serum Ferritin Has Limited Prognostic Value on Mortality Risk in Patients with Decompensated Cirrhosis: A Propensity Score Matching Analysis

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ABSTRAK (ENGLISH)

Objective

The prognostic value of serum ferritin remains elusive in the literature. We aimed to examine the association between serum ferritin and mortality risk in cirrhosis.

Methods

A total of 257 cirrhotic patients were recruited. The cut-off of serum ferritin was determined by X-tile. The Cox regression and Kaplan-Meier method were used. A 1:1 propensity score matching (PSM) was performed to diminish the impacts of selection bias and possible confounders.

Results

The difference regarding mortality was mostly significant for serum ferritin >158 ng/mL. Before PSM, serum ferritin >158 ng/mL was an independent predictor of mortality. However, the clinical relevance of high ferritin level for prognostication was blunted after PSM (survival rate: 86.8% vs 96.3%, *P* = .078). Cox regression indicated that model for end-stage liver disease remains only independent risk factor of 180-day mortality after PSM.

Conclusion

Serum ferritin may not serve as an independent prognostic indicator of mortality risk in decompensated cirrhotic patients.

A Meta-Analysis on the Association of Colibactin-Producing pks + Escherichia coli with the Development of Colorectal Cancer

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ABSTRAK (ENGLISH)

Objective

Previous studies on the association between *pks*$^{+}$*Escherichia coli* and colorectal cancer (CRC) demonstrated conflicting results. Hence, we performed a meta-analysis to obtain more precise estimates.

Methods

Related literature was obtained from PubMed, ScienceDirect, Google Scholar, and Cochrane Library. Data were then extracted, summarized, and subjected to analysis using Review Manager 5.4 by computing for the pooled odds ratios at the 95% confidence interval.

Results

Overall analysis showed that individuals carrying *pks*$^{+}$*E coli* had a greater risk of developing CRC. Subgroup analysis further showed that individuals from Western countries carrying *pks*$^{+}$*E coli* and individuals with *pks*$^{+}$*E coli* in their tissue samples had increased risk of developing CRC.

Conclusion

Results of this meta-analysis suggest that individuals with *pks*$^{+}$*E coli* have a greater risk of developing CRC. However, more studies are needed to confirm our claims.

Dokumen 3 dari 44

Mycoplasma hominis Meningitis Diagnosed by Metagenomic Next-Generation Sequencing in a Preterm Newborn: a Case Report and Literature Review

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ABSTRAK (ENGLISH)

Mycoplasma hominis is mainly colonized in the genital tract and vertically transmitted to newborns; however, it rarely causes neonatal meningitis. We report a case of *M. hominis* meningitis in a premature infant. She was admitted to our hospital for treatment after 6 days of repeated fever. After admission, repeated cerebrospinal fluid (CSF) analysis showed that leukocytes and protein in CSF increased substantially and glucose decreased, but there was no growth in conventional CSF culture. The patient was diagnosed with *M. hominis* meningitis by metagenomic next-generation sequencing (mNGS). The antibiotic therapy used for the neonate was meropenem, vancomycin, and ampicillin against bacterial infection and azithromycin against mycoplasma infection. The child was subsequently considered cured and discharged from the hospital and followed up regularly in the neurology clinic. The mNGS may be a promising and effective diagnostic technique for identifying uncommon pathogens of meningitis in patients with meningitis symptoms and signs without microbial growth in routine CSF culture.

Dokumen 4 dari 44

Increased Levels of ANGPTL3 and CTRP9 in Patients With Obstructive Sleep Apnea and Their Relation to Insulin Resistance and Lipid Metabolism and Markers of Endothelial Dysfunction

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ABSTRAK (ENGLISH)

Objective

Obstructive sleep apnea (OSA) has a close relation with obesity and perturbation in adipokines and hepatokines, which are linked to OSA consequences such as insulin resistance, dyslipidemia, and endothelial dysfunction. This study aimed to assess the relation of C1q/TNF-related protein 9 (CTRP9) and angiopoietin-like protein 3 (ANGPTL3) with OSA and biochemical measurements.

Methods

Serum levels of ANGPTL3, CTRP9, adiponectin, leptin, intercellular adhesion molecule 1 (ICAM-1), and vascular cell adhesion protein 1 (VCAM-1) were determined in 74 OSA patients and 27 controls using enzyme-linked immunosorbent assay kits.

Results

Levels of ANGPTL3, CTRP9, leptin, ICAM-1, and VCAM-1 were increased in the patients compared to the controls, whereas adiponectin levels decreased. ANGPTL3 had a positive correlation with total cholesterol, triglyceride, low-density lipoprotein cholesterol, ICAM-1, and VCAM-1 and was inversely correlated with leptin. CTRP9 showed a positive correlation with body mass index, insulin resistance, ICAM-1, and VCAM-1.

Conclusion

The results indicated the relation of ANGLTP3 and CTRP9 with OSA and its complications, which suggested a possible role for these factors in the consequences of OSA.

Association of Catalase Gene Polymorphisms with Idiopathic Nephrotic Syndrome in a Chinese Pediatric Population

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ABSTRAK (ENGLISH)

Objective

Our aim was to investigate the association between gene polymorphisms in *catalase* (*CAT*), a well-known oxidative stress regulator, and susceptibility to idiopathic nephrotic syndrome (INS) or responses to steroid therapy in a Chinese pediatric population.

Methods

We analyzed 3 *CAT* single-nucleotide polymorphisms (SNVs; rs7943316, rs769217, and rs12270780) using multi-polymerase chain reaction combined with next-generation sequencing in 183 INS patients and 100 healthy controls.

Results

For the allele and genotype frequencies of the *CAT* SNVs, no significant differences were observed between INS

patients and controls. Patients with C allele of *CAT* rs769217 had a higher risk of developing steroid-dependent nephrotic syndrome than the steroid-sensitive nephrotic syndrome patients (P = 0.018; odds ratio = 1.76).

Conclusion

Our data suggests that genetic variations in *CAT* were unlikely to confer susceptibility to INS in Chinese children, whereas the C allele of the *CAT* rs769217 polymorphism showed a strong association with steroid-dependent responses in Chinese INS children.

Association between Methylene-Tetrahydrofolate Reductase C677T Polymorphism and Human Immunodeficiency Virus Type 1 Infection in Morocco

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ABSTRAK (ENGLISH)

Human immunodeficiency virus type 1 (HIV-1) infection varies substantially among individuals. One of the factors influencing viral infection is genetic variability. Methylenetetrahydrofolate reductase (*MTHFR*) C677T polymorphism is a genetic factor that has been correlated with different types of pathologies, including HIV-1. The *MTHFR* gene encodes the MTHFR enzyme, an essential factor in the folate metabolic pathway and in maintaining circulating folate and methionine at constant levels, thus preventing the homocysteine accumulation. Several studies have shown the role of folate on $CD4^+$ T lymphocyte count among HIV-1 subjects. In this case-control study we aimed to determine the association between the *MTHFR* C677T polymorphism and HIV-1 infection susceptibility, AIDS development, and therapeutic outcome among Moroccans. The C677T polymorphism was genotyped by polymerase chain reaction followed by fragment length polymorphism digestion in 214 participants living with HIV-1 and 318 healthy controls. The results of the study revealed no statistically significant association between *MTHFR* C677T polymorphism and HIV-1 infection (P >.05). After dividing HIV-1 subjects according to their AIDS status, no significant difference was observed between C677T polymorphism and AIDS development (P >.05). Furthermore, regarding the treatment response outcome, as measured by HIV-1 RNA viral load and $CD4^+$ T cell counts, no statistically significant association was found with *MTHFR* C677T polymorphism. We conclude that, in the genetic

context of the Moroccan population, *MTHFR* C677T polymorphism does not affect HIV-1 infection susceptibility, AIDS development, or response to treatment. However, more studies should be done to investigate both genetic and nutritional aspects for more conclusive results.

Dokumen 7 dari 44

Incidental Discovery of a Patient with the Bombay Phenotype

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Link dokumen ProQuest

ABSTRAK (ENGLISH)

Bombay phenotype, an exceptionally rare blood type in individuals outside of Southeast Asia, occurs in approximately 1 in 1,000,000 individuals in Europe. This blood phenotype is characterized by the absence of the H antigen on red blood cells (RBCs) and in secretions. As the H antigen is the structure on which the ABO system is built, individuals lacking this antigen are unable to produce A or B antigens and appear as type O on routine ABO phenotyping. H deficiency does not cause ill effect; however, these individuals produce an anti-H alloantibody capable of causing severe acute hemolytic transfusion reactions when exposed to RBCs that express the H antigen. In this case study, we highlight the incidental discovery of a patient with Bombay phenotype in a North American hospital system, expected test results, the immunologic and genetic basis underlying the Bombay and para-Bombay phenotypes, and methods to ensure availability of compatible blood.

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About the Journal

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Dokumen 9 dari 44

Blood Donors with Thalassemic Trait, Glucose-6-Phosphate Dehydrogenase Deficiency Trait, and Sickle Cell Trait and Their Blood Products: Current Status and Future Perspective

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ABSTRAK (ENGLISH)

The use of blood products for different medical purposes has increased in recent years. To meet increasing demand, some blood centers allow volunteer donors with thalassemic trait, glucose-6-phosphate dehydrogenase deficiency (G6PD) trait, and sickle cell trait (SCT) to donate blood if their hemoglobin values fall within acceptable ranges and show no signs of hemolysis. Currently, there are no standard guidelines or policies regarding the use or management of blood products obtained from these donors. However, in recent years, there has been advanced research on eligible donors who have these underlying conditions. In this review, we summarize the current knowledge from in vitro and in vivo studies regarding donor characteristics, changes in physical and biochemical parameters in blood products during processing and storage, and posttransfusion efficacy of blood products. In addition, we discuss some unresolved issues concerning blood products from thalassemic trait, G6PD-deficiency trait, and SCT donors.

Dokumen 10 dari 44

Pourbiax Diagrams as an Aid to Understanding the Impact of Acid/Base Disturbance on Blood Glucose Point-of-Care Testing

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ABSTRAK (ENGLISH)

Objective

Assays based on redox reactions that involve proton transfer are vulnerable to artifactual findings in metabolic acidosis/alkalosis. We evaluated the impact of pH on the measurement of blood glucose by the glucose dehydrogenase/pyrroloquinoline quinone system used in point-of-care-testing.

Methods

We applied a series of thermodynamic equations to adjust the Gibbs energy for the pyrroloquinoline quinone couple. This adjusts values taken under standard conditions to those more closely resembling the physiological state.

Results

Under standard conditions, the pyrroloquinoline quinone couple has $E^{\circ} = -0.125$ V whereas adjustment to the physiological state (pH 7.40, ionic strength 0.15 mol/L, and temperature 310.15°K) yields $E^{\circ\prime} = -0.166$ V. This corresponds to an uncertainty in blood glucose determination of approximately 0.13 mmol/L.

Conclusion

We have demonstrated that the impact of pH on blood glucose determination by the glucose dehydrogenase/pyrroloquinoline quinone system (under physiologically relevant conditions of ionic strength and temperature) is not clinically significant.

Culturing Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) for Diagnosis and Genome Sequencing

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ABSTRAK (ENGLISH)

Objective

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) nucleic acid detection “re-positive” phenomenon is encountered clinically. The accuracy of a viral nucleic acid test is crucial to prevent reintroduction of the virus into the community. This study evaluated the effect of virus culturing on increasing the sensitivity and specificity of real-time polymerase chain reaction (RT-PCR) detection and viral genomic sequencing.

Methods

A series of tenfold dilutions of a SARS-CoV-2 viral stock were conducted and cultured for either 24 or 48 hours. The viral load of cultured samples was determined by RT-PCR. The cultured and non-cultured samples of 1x 50% tissue culture infectious dose (TCID50) were sequenced using metagenomic next-generation sequencing. The depth and coverage of SARS-CoV-2 genome were measured.

Results

The lowest viral load detectable in a sample with RT-PCR was 0.01 TCID50. After a 24-h culture, the viral ORF 1ab and *N*-gene cycle threshold (CT) values were reduced by 4.4 points and 1 point, respectively. One TCID50 viral load

of post 24-h culture revealed the sequence depth reached an average of 752 reads, compared with 0.15 in the nonculture; furthermore, the coverage was 99.99% while 6.42% in the nonculture.

Conclusion

These results indicate that virus culturing can significantly increase the viral load, which can increase the certainty of true-positive detection of the viral nucleic acids, and improve the quality of virus genomic sequencing.

Dokumen 12 dari 44

Essential Thrombocythemia and Post-Essential Thrombocythemia Myelofibrosis: Updates on Diagnosis, Clinical Aspects, and Management

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ABSTRAK (ENGLISH)

Although several decades have passed since the description of myeloproliferative neoplasms (MPN), many aspects of their pathophysiology have not been elucidated. In this review, we discuss the mutational landscape of patients with essential thrombocythemia (ET), prognostic scores and salient pathology, and clinical points. We discuss also the diagnostic challenges of differentiating ET from prefibrotic MF.

We then focus on post-essential thrombocythemia myelofibrosis (post-ET MF), a rare subset of MPN that is usually studied in conjunction with post-polycythemia vera MF. The transition of ET to post-ET MF is not well studied on a molecular level, and we present available data. Patients with secondary MF could benefit from allogenic hematopoietic stem cell transplantation, and we present available data focusing on post-ET MF.

Dokumen 13 dari 44

MLL1:EZH2 Ratio in Uterine Secretions and Endometrial Receptivity in Patients with Endometriosis

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ABSTRAK (ENGLISH)

Objective

To establish a novel approach for diagnosing endometriosis (EM) in patients with impaired endometrial receptivity.

Method

Mixed lineage leukemia 1 (MLL1) and enhancer of zeste homolog 2 (EZH2) levels were analyzed. The MLL1:EZH2 ratio in identifying impaired endometrial receptivity has been established and validated.

Results

In normal endometrial tissue, the MLL1:EZH2 ratio increased significantly in the midsecretory phase, compared with that in the proliferative phase. In the midsecretory phase, the MLL1:EZH2 ratio in endometrial tissues and uterine secretions accurately identifies patients with EM who have impaired endometrial receptivity. In the validation group, the sensitivity and specificity of the MLL1:EZH2 ratio in the uterine secretions of the midsecretory phase, in diagnosing patients EM who have impaired endometrial receptivity, were 100% and 96.55%, respectively.

Conclusions

The MLL1:EZH2 ratio in uterine secretions of the midsecretory phase may serve as a marker to diagnose EM in patients with impaired endometrial receptivity.

Dokumen 14 dari 44

Coping with the COVID-19 Pandemic: How a Master’s in Clinical Laboratory Sciences Program Adapted Through the Modification of Existing Resources

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Link dokumen ProQuest

ABSTRAK (ENGLISH)

Objective

Our aim was to describe the rapid adaption of a Master of Clinical Laboratory Sciences (MCLS) program to the abrupt suspension of classroom instruction and laboratory training at affiliated hospitals in compliance with the New York governor’s executive order in March 2020.

Methods

Teaching modifications included greater emphasis on Zoom video conferencing, Media Lab assignments, independent self-study, and online testing.

Results

Instruction of academic coursework continued uninterrupted using previously established teaching modalities. Clinical training presented 2-fold concerns, credit hours needed for the master’s degree and clinical hours required for New York State licensing. The latter was delayed.

Conclusion

The real-time need to deliver laboratory science education during a time of statewide closure was fulfilled using available teaching modalities. The resulting uninterrupted academic and clinical training ensured the education of the incoming workforce of our clinical laboratories. This teaching strategy may be considered during new curricula development in preparation for times of future crises.

Dokumen 15 dari 44

A Literature Review on How We Can Address Medical Laboratory Scientist Staffing Shortages

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ABSTRAK (ENGLISH)

Objective

Laboratories are facing a critical shortage of medical laboratory scientists (MLS) and medical laboratory technicians (MLT) to address an increasing demand for laboratory testing. Training program closures, fewer student applicants, and financial decisions have contributed to staffing shortages. Lack of visibility, low wages, and perceived lack of opportunities for upward career mobility contribute to challenges in recruiting and retaining qualified individuals and students who are unaware of laboratory medicine careers. Our goal was to review the literature to determine the current state and consequences of staffing shortages, and potential solutions to address these shortages.

Methods

Medline/PubMed, PubMed Central, MeSH, Google Scholar, and Marshall Digital Scholar were used as resources.

Discussion/Conclusions

A collaboration of stakeholders is needed to identify staffing challenges, barriers, and solutions and to increase visibility of laboratory professionals. Early recruitment is best started in the middle and high school educational process.

Dokumen 16 dari 44

Assessment of the Stability of Midregional Proadrenomedullin in Different Biological Matrices

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ABSTRAK (ENGLISH)

Midregional proadrenomedullin (MR-proADM) has been shown to play a key role in endothelial dysfunction, with increased levels helping to prevent early stages of organ dysfunction. Recent clinical evidence has demonstrated MR-proADM to be a helpful biomarker to identify disease severity in patients with sepsis as well as pneumonia. This biomarker is helpful at triage in emergency departments to assess risk level of patients. The aim of this study is to evaluate the stability of MR-proADM in different biological matrices. The results, obtained by Bland-Altman and scatter plot analyses, demonstrate that deviation of MR-proADM concentration in serum compared to EDTA plasma unequivocally shows that serum should not be used as a sample matrix. Instead, the excellent correlation of heparin plasma vs EDTA plasma samples shows that heparin plasma can be used without reservation in clinical routine and emergency samples.

Dokumen 17 dari 44

Serum Leukocyte Cell-Derived Chemotaxin 2 (LECT2) Level Is Associated with Osteoporosis

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ABSTRAK (ENGLISH)

Objective

The aim of this study was to examine serum leukocyte cell-derived chemotaxin 2 (LECT2) levels in osteoporosis subjects to confirm its association with osteoporosis.

Methods

A total of 204 adult subjects were recruited. Bone mineral densities (BMD) were assessed and blood samples were collected for measurements of biomedical parameters and the bone turnover markers. Serum LECT2 levels were measured by enzyme-linked immunosorbent assay. The relationships between serum LECT2 levels and other parameters were analyzed using the Spearman correlation coefficient.

Results

Serum LECT2 levels were significantly increased in osteoporosis subjects over controls. We found a significantly negative correlation of serum LECT2 with BMD, 25-hydroxy-vitamin D, and creatinine and a significantly positive correlation with C-terminal telopeptide of type 1 collagen and total cholesterol.

Conclusion

Serum LECT2 levels were significantly upregulated in osteoporosis subjects and correlated with the severity of bone loss. Serum LECT2 could be a potential biomarker to assess the risk of bone loss.

COP27 Climate Change Conference: Urgent Action Needed for Africa and the World: Wealthy nations must step up support for Africa and vulnerable countries in addressing past, present and future impacts of climate change †

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Compliance with the Current NCCN Guidelines and Its Critical Role in Pancreatic Adenocarcinoma

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ABSTRAK (ENGLISH)

Objectives

Since 2019, the National Comprehensive Cancer Network (NCCN) has recommended genetic testing for patients diagnosed with pancreatic adenocarcinoma that includes universal germline testing and tumor gene profiling for metastatic, locally advanced, or recurrent disease. However, testing compliance with this guideline has not yet been published in the English literature.

Methods

A quality assurance/quality improvement retrospective review was done to identify patients diagnosed with pancreatic adenocarcinoma from January 2019 to February 2021 to include the patient's clinical status and genetic test results.

Results

There were 20 patient cases identified with pancreatic adenocarcinoma. A total of 11 cases had molecular tumor gene profiling and microsatellite instability/mismatch repair (MSI/MMR) testing performed and 1 case had only MSI/MMR testing by immunohistochemistry performed. Only 3 patients of the 20 in total received germline testing.

Conclusion

There was a significant number of patients for whom tumor gene profiling or germline testing had never been attempted as per recommended NCCN guidelines.

Application of the Single-Molecule Real-Time Technology (SMRT) for Identification of HKαα Thalassemia Allele

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ABSTRAK (ENGLISH)

Objective

Single-molecule real-time technology (SMRT) is a sequencing technology using the DNA polymerases and fluorescently tagged nucleotides to accurately sequence DNA strands. The purpose of this study was to evaluate the detection accuracy of SMRT for identification of the Hong Kongαα (HKαα) thalassemia allele.

Methods

We conducted a blinded study of 33 samples of known HKαα alleles. These alleles were detected using SMRT to evaluate accuracy.

Results

We conducted a blinded study of 33 known HKαα samples and found all HKαα variants detected by SMRT to be concordant with those independently assigned by gap-polymerase chain reaction (gap-PCR), reverse dot blot hybridization, and 2-round nested PCR. In addition, SMRT detected 2 β-thalassemia variants that were missed by conventional techniques.

Conclusion

The results demonstrate that SMRT offers a higher detection accuracy of thalassemia rare and new loci. It is an efficient, reliable, and broad-spectrum test that can be widely used for thalassemia screening in the clinic.

Causes of Inappropriate Laboratory Test Ordering from the Perspective of Medical Laboratory Technical Professionals: Implications for Research and Education

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ABSTRAK (ENGLISH)

Objective

Inappropriate laboratory test ordering is a significant and persistent problem. Many causes have been identified and studied. Medical laboratory professionals (MLPs) are technical staff within clinical laboratories who are uniquely positioned to comment on why inappropriate ordering occurs. We aimed to characterize existing MLP perceptions in this domain to reveal new or underemphasized interventional targets.

Methods

We developed and disseminated a self-administered survey to MLPs in Canada, including open-ended responses to questions about the causes of inappropriate laboratory test ordering.

Results

Four primary themes were identified from qualitative analysis: ordering-provider factors, communication factors, existing test-ordering processes, and patient factors. Although these factors can largely be found in previous literature, some are under-studied.

Conclusion

MLP insights into nonphysician triage ordering and poor result communication provide targets for further investigation. A heavy focus on individual clinician factors suggests that current understandings and interprofessional skills in the MLP population can be improved.

Dokumen 22 dari 44

Evaluation of RT-LAMP Assay for Rapid Detection of SARS-CoV-2

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ABSTRAK (ENGLISH)

Objective

To evaluate the accuracy of the reverse transcription loop-mediated isothermal amplification (RT-LAMP) assay for rapid detection of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in community or primary-care settings.

Method

We systematically searched the Web of Science, Embase, PubMed, and Cochrane Library databases. We conducted quality evaluation using ReviewManager software (version 5.0). We then used MetaDisc software (version 1.4) and Stata software (version 12.0) to build forest plots, along with a Deeks funnel plot and a bivariate boxplot for analysis.

Result

Overall, the sensitivity, specificity, and diagnostic odds ratio were 0.79, 0.97, and 328.18, respectively. The sensitivity for the subgroup with RNA extraction appeared to be higher, at 0.88 (0.86–0.90), compared to the subgroup without RNA extraction, at 0.50 (0.45–0.55), with no significant difference in specificity.

Conclusion

RT-LAMP assay exhibited high specificity regarding current SARS-CoV-2 infection. However, its overall sensitivity was relatively moderate. Extracting RNA was found to be beneficial in improving sensitivity.

Dokumen 23 dari 44

Application of the Fluorescence Method on Sysmex XN9000 Hematology Analyzer for Correcting Platelet Count in Individuals with Microcytosis

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ABSTRAK (ENGLISH)

Objective

Although small red blood cells are a well-known analytical pitfall that could cause artifactual increase of the platelet count, limited information is available on the accuracy of impedance platelet counting in cases with microcytosis. The aim of this study is to assess the accuracy of impedance platelet counting in the presence of small red blood cells, and to establish the optimal mean corpuscular volume (MCV) cutoff to endorse fluorescence platelet counting.

Methods

In this study, platelet counts estimated by the impedance method on the Sysmex XN9000 analyzer (Sysmex, Kobe, Japan) were compared with those provided by the fluorescence method. The accuracy of impedance platelet counting was assessed. Receiver operating characteristic curve was used to evaluate the performance of MCV in predicting falsely increased platelet counts.

Results

There was a tendency for the impedance method to overestimate the platelet count in samples with 70 fL <MCV ≤ 80 fL, 60 fL <MCV ≤ 70 fL, MCV ≤ 60 fL. Receiver operating characteristic curve analysis showed that a 73.5fL cutoff of MCV was highly sensitive in predicting falsely increased platelet counts.

Conclusion

In cases with MCV <73.5 fL, we strongly suggest that the platelet counts obtained by the impedance method on the Sysmex XN9000 analyzer should be checked and corrected by fluorescence counting.

Diagnostic Efficiency of Serum-Based Infrared Spectroscopy in Detecting Breast Cancer: A Meta-Analysis

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Link dokumen ProQuest

ABSTRAK (ENGLISH)

Background

The advancement of Fourier transform infrared (FTIR) spectroscopy as a potential diagnostic tool in the clinical setting has been studied over the years, particularly its application in cancer diagnostics.

Objective

To summarize previous research on FTIR spectroscopy in detecting breast cancer using serum specimens.

Methods

Related literature was searched and screened from various databases. Relevant data were then extracted, tabulated, and analyzed using Meta-DiSc 1.4 software.

Results

Sensitivity and specificity rates were 90% to 100% and 80% to 95%, respectively. The area under the receiver operating characteristic curve was at 0.9729, indicating that serum analysis via FTIR spectroscopy can accurately discriminate between healthy individuals and patients with breast cancer.

Conclusion

Overall, FTIR spectroscopy for breast cancer diagnosis using serum specimens shows promising results. However, further studies are still needed to validate these claims.

Transcription Factor ZNF326 Upregulates the Expression of ERCC1 and HDAC7 and its Clinicopathologic Significance in Glioma

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ABSTRAK (ENGLISH)

Previous reports that we have coauthored have shown that transcription factor *ZNF326* can upregulate the expression of ERCC1 and HDAC7, and downregulate the expression of LTBP4 and ZNF383 in lung-cancer cells. However, whether tissue-specificity of the *ZNF326* function exists in glioma tissue remains unclear. In this study, overexpression or knockdown of *ZNF326* in glioma cells caused upregulation or downregulation, respectively, of the protein and micro RNA (mRNA) levels of ERCC1 and HDAC7. The levels of LTBP4 and ZNF383 were not significantly changed. Immunohistochemical results showed that *ZNF326* was not only highly expressed in glioma but was also positively correlated with the expression of ERCC1 and HDAC7. Moreover, the expression of ERCC1 and HDAC7 was enhanced with the increase in tumor grade. However, there was no correlation between *ZNF326*

and the expression of LTBP4 and ZNF383. Therefore, the detection of *ZNF326*, ERCC1, and HDAC7 expressions was useful for identifying different grades of glioma.

Dokumen 26 dari 44

The Effect of Information Technology on the Information Exchange between Laboratories and Ambulatory Care Centers: A Systematic Review

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Link dokumen ProQuest

ABSTRAK (ENGLISH)

Laboratory services form an integral part of medical care in the decision-making of physicians, including those working at ambulatory care centers. Information exchange is essential between ambulatory care centers and laboratories. Inevitable errors have always existed in the exchange of such information on paper, which can be to some extent avoided by developing appropriate computer-based interfaces. Therefore, this review aimed to examine studies conducted to determine the effect of electronic communication between ambulatory care centers and laboratories. This systematic review was conducted on the basis of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. Studies were searched in the PubMed, Embase, Cochrane, and Web of Science, and those written in English and published between 2000 and February 2019 with full texts available were selected. From a total of 3898 papers retrieved from the studied databases, 24 papers were eligible for entering this study after removing similar and nonrelated studies. Electronic exchanges between ambulatory care centers and laboratories can have numerous benefits in terms of financial, organizational, and quality. This evidence for the value of electronic communications is an important factor contributing to its local investment and adoption.

Dokumen 27 dari 44

Anti-M–Induced Delayed Hemolytic Transfusion Reaction

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ABSTRAK (ENGLISH)

Background

Anti-M is most often assumed to be naturally occurring and can be comprised of a mixture of predominantly immunoglobulin(Ig)M with a lesser IgG component. Anti-M-antibodies usually do not react at 37°C and therefore are considered to be of little clinical significance.

Methods

A 28-year-old man presented with hemorrhagic shock from numerous injuries sustained in a motor vehicle collision. The patient received several units of red blood cells (RBCs). The antibody screen, the direct antiglobulin test (DAT), and the RBC genotype were sent for laboratory evaluation.

Results

A total of 12 days after the first antibody screening result was negative (7 days after transfusion), the lowest hemoglobin value was 5.5 g per dL, and we observed a positive antibody screening result and DAT with immunoglobulin (Ig)G anti-M identified. After transfusion of 4 units of M antigen–negative RBC, the post-transfusion hemoglobin level increased to 8.9 g per dL.

Conclusion

Obtaining M antigen–negative compatible RBCs is necessary in patients demonstrating IgG anti-M in plasma.

STAT5: From Pathogenesis Mechanism to Therapeutic Approach in Acute Leukemia

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ABSTRAK (ENGLISH)

Background

Based on the results of multiple studies, multiple signaling pathways is a major cause of resistence to chemotherapy in leukemia cells. Signal transducer and activator of transcription 5 (*STAT5*) is among these factors; it plays an essential role in proliferation of leukemic cells.

Methods

We obtained the materials used in our study via PubMed search from 1996 through 2019. The key search terms included “STAT5,” “acute leukemia,” “leukemogenesis,” and “mutation.”

Results

On activation, STAT5 not only inhibits apoptosis of leukemic cells via activating the B-cell lymphoma 2 (*BCL-2*) gene but also inhibits resistance to chemotherapy by enhancing human telomerase reverse transcriptase (hTERT) expression and maintaining telomere length in cells. It has also been shown that a number of mutations in the *STAT5* gene and in related genes alter the expression of *STAT5*.

Conclusion

The identification of *STAT5* and the factors activated in its up- or downstream expression, affecting its function, contribute to better treatments such as targeted therapy rather than chemotherapy, improving the quality of life patients.

Benign Pancreatic Hyperenzymemia, Also Known as Gullo’s Syndrome

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ABSTRAK (ENGLISH)

Benign pancreatic hyperenzymemia, also known as Gullo’s syndrome, is a little-known syndrome first described in 1996 in patients studied for an elevation of pancreatic enzymes while otherwise being asymptomatic. We describe the case of a 2-year-old patient who was found to have significant elevation of amylase and lipase levels while he was asymptomatic. Blood tests and imaging tests were performed to determine the etiology, but they gave normal results. The enzyme elevation can even be 10 times the normal value of the enzyme, and only 1 enzyme may elevate, although most often all pancreatic enzymes are elevated. The etiology is not known, although several

hypotheses have been suggested. This enzyme elevation is described both in adults and children and also sporadically or with a familial pattern. Knowledge of it can limit the performance of the multiple complementary test, some of which are very invasive in patients who have elevated pancreatic enzymes while they are asymptomatic. It knowledge allows us to confirm a benign prognosis about it and reassure the family about this disease and that in the end it will not require aggressive treatments such as surgery or chemotherapy.

Dokumen 30 dari 44

False-Positive Enzymatic Alcohol Results in Perimortem Specimens

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ABSTRAK (ENGLISH)

Herein, we present 2 cases referred to the North Carolina Office of the Chief Medical Examiner (NC OCME) in which ethanol results reported by different hospital laboratories, using alcohol dehydrogenase (ADH)–based assays, were positive, whereas results of headspace gas chromatography testing performed in the NC OCME laboratory were negative. Literature reports suggest that false-positive ethanol measurements from ADH-based assays can occur when a combination of elevated lactate and lactate dehydrogenase (LD) are present in the specimen. The results were reported in perimortem specimens collected from 2 children with unrelated medical conditions. The cases and associated clinical parameters are considered based on the lactate/LD explanation for the false-positive results, to facilitate the recognition of circumstances that can produce erroneous serum ethanol results.

Dokumen 31 dari 44

Frank H. Wians, Jr., PhD, MT(ASCP), Editor, 2004 – 2012

Dokumen 32 dari 44

Grossing Technology Today and Tomorrow

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ABSTRAK (ENGLISH)

Objective

To describe the perspective of grossing technology and highlight the prospective of its development in histology laboratory.

Methods

Analysis of different components of grossing technology.

Results

Increased requirements for a specimen's turnaround time and the advancements in modern processing equipment make the triage of workflow a significant part of a grossing person's responsibilities. The implementation of digital pathology in morphology studies practice requires standardization of fixation, the thickness of gross section, and optimal embedding orientation. To meet tomorrow's challenges, grossing technology should work on embedding automation and gross digital pathology to record gross sections corresponding the microscope slide. Specialization of grossing stations might be beneficial to the quality of processing and smooth workflow productivity. The emerging grossing technologist subspecialty requires development of a special training program.

Conclusion

Grossing technology can contribute to new challenges in modern histology laboratory, assuring high-quality microscope slides for the pathologist's diagnosis and research evaluation.

Dokumen 33 dari 44

The History of Laboratory Medicine Part 4: 2004–2012; A New Journal for the New Century

Bertholf, Roger L

Dokumen 34 dari 44

Enhanced Carrier Screening for Spinal Muscular Atrophy: Detection of Silent (SMN1 : 2 + 0) Carriers Utilizing a Novel TaqMan Genotyping Method

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ABSTRAK (ENGLISH)

Background

Individuals whose copies of the survival motor neuron 1 (*SMN1*) gene exist on the same chromosome are considered silent carriers for spinal muscular atrophy (SMA). Conventional screening for SMA only determines *SMN1* copy number without any information regarding how those copies are arranged. A single nucleotide variant (SNV) rs143838139 is highly linked with the silent carrier genotype, so testing for this SNV can more accurately assess risk to a patient of having an affected child.

Methods

Using a custom-designed SNV-specific Taqman genotyping assay, we determined and validated a model for silent-carrier detection in the laboratory.

Results

An initial cohort of 21 pilot specimens demonstrated results that were 100% concordant with a reference laboratory method; this cohort was utilized to define the reportable range. An additional 177 specimens were utilized for a broader evaluation of clinical validity and reproducibility. Allelic-discrimination analysis demonstrated tight clustering of genotype groupings and excellent reproducibility, with a coefficient of variation for all genotypes ranging from 1% to 4%.

Conclusion

The custom-developed Taqman SNV genotyping assay we tested provides a rapid, accurate, and cost-effective method for routine SMA silent-carrier screening and considerably improves detection rates of residual risk for SMA carriers.

Dokumen 35 dari 44

Clinical Use of κ Free Light Chains Index as a Screening Test for Multiple Sclerosis

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ABSTRAK (ENGLISH)

Objective

To assess the usefulness of the κ free light chain index (κFLCi) as a screening test to identify patients with suspected MS.

Methods

The study included 56 patients with a request to test for oligoclonal bands (OCBs). OCBs were detected by isoelectric focusing, followed by immunofixation. Cerebrospinal fluid (CSF) and serum κFLC were measured by a turbidimetric assay. Also, the κFLC index (κFLCi) was calculated.

Results

CSF κFLC levels and κFLCi were significantly higher in patients with multiple sclerosis (MS) than in patients with other neurological diseases (NDs; *P* <.001 and *P* <.001, respectively). At the cutoff value of 2.9, the κFLCi detected MS with sensitivity of 97% and specificity of 65%. Overall, 92% patients with κFLCi of 2.9 or greater and who had tested positive for OCBs were diagnosed as having MS.

Conclusion

Our findings support the use of κFLCi as a screening test when MS is suspected, followed by OCB detection as a confirmatory test for the diagnosis of MS.

Dokumen 36 dari 44

The Diverse Upper Reference Limits of Serum Thyroid-Stimulating Hormone on the Same Platform for Pregnant Women in China

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ABSTRAK (ENGLISH)

Objective

To describe the diverse upper reference limits of serum thyroid stimulating hormone on the same platform for pregnant women in China.

Methods

The trimester-specific and population-specific TSH reference intervals for pregnant women were established, and then 5 reference intervals on the same platform in China were compared with the reference intervals derived from the present study and the manufacturer.

Results

The most striking difference in the upper reference limits of TSH among 5 reference intervals on the same platform was shown at the first trimester of pregnancy. The calculated regional prevalence rates of subclinical thyroid diseases varied using the data derived from 30,771 pregnant women who visited the largest obstetric center in our district from 2008 to 2018.

Conclusion

We reported differences among 7 reference intervals of TSH on the same platform and showed the changing population factors significantly affected them.

About the Journal

Flow Cytometry in the Differential Diagnosis of CD10-Positive Nodal Lymphomas

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ABSTRAK (ENGLISH)

Background

Differences between follicular lymphoma (FL) and diffuse large B-cell lymphoma/high-grade B-cell lymphoma (DLBCL/HGBL) by flow cytometry are underexplored.

Methods

We retrospectively assessed flow cytometry results from 191 consecutive lymph node biopsies diagnosed with FL or DLBCL/HGBL.

Results

The only parameters that differed between the 2 groups in the derivation cohort were forward scatter and side scatter ($P < 10^{-6}$; area under the curve [AUC], 0.75–0.8) and %CD23 ($P = .004$; area under the receiver characteristic operating curve, 0.64). However, since light scatter characteristics did not distinguish between grade 3 FL and DLBCL/HGBL, we set out to develop a model with high sensitivity for the exclusion of the latter. Several models, including FS and %CD23, were tested, and 2 models showed a sensitivity of >0.90, with negative predictive values of ≥0.95, albeit with low specificity (0.45 to 0.57).

Conclusion

Two simple models enable the exclusion of DLBCL/HGBL with a high degree of confidence.

Dokumen 39 dari 44

Allogeneic Peripheral Blood Stem Cell Transplant: Correlation of Donor Factors with Yield, Engraftment, Chimerism, and Outcome: Retrospective Review of a Single Institute During a 3-Year Period

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ABSTRAK (ENGLISH)

Background

Donor factors have a variable correlation with cluster of differentiation (CD)34+ cell dose in allogeneic peripheral blood stem cell (PBSC) harvests. CD34+ cell dose affects the speed of hematopoietic recovery and percentage of donor chimerism in the recipient.

Methods

A total of 25 allogeneic PBSC transplants performed during a 3-year period were included. All donors underwent mobilization with filgrastim. Leukapheresis, flowcytometric CD34+ cell enumeration, and chimerism analysis were performed and correlated with recipient outcome.

Results

Besides age, all other donor parameters had a positive correlation with CD34+ cell count. Engraftment kinetics and chimerism had a positive correlation with the CD34+ yield of the PBSC product. Acute graft-vs-host disease (GVHD) was observed in patients with complete chimerism at day 30 after transplantation.

Conclusion

Adequate CD34+ cell yield happens in healthy donors, independent of donor demographic patterns with G-CSF only. A diverse population of donors can thus be approached for Matched Unrelated Donor (MUD) transplants. An accurate quantitative analysis of early donor chimerism in the recipient (at day 30) is an excellent tool for post-transplant monitoring for acute GvHD.

Dokumen 40 dari 44

The Usefulness of Autopsy

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Link dokumen ProQuest

Dokumen 41 dari 44

A Predictive Model for the Identification of Cardiac Effusions Misclassified by Light's Criteria

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Link dokumen ProQuest

ABSTRAK (ENGLISH)

Objectives

The application of Light's criteria misidentifies approximately 30% of transudates as exudates, particularly in patients on diuretics with cardiac effusions. The purpose of this study was to establish a predictive model to effectively identify cardiac effusions misclassified by Light's criteria.

Methods

We retrospectively studied 675 consecutive patients with pleural effusion diagnosed by Light's criteria as exudates, of which 43 were heart failure patients. A multivariate logistic model was developed to predict cardiac effusions. The performance of the predictive model was assessed by receiver operating characteristic (ROC) curves, as well as by examining the calibration.

Results

It was found that protein gradient of >23 g/L, pleural fluid lactate dehydrogenase (PF-LDH) levels, ratio of pleural fluid LDH to serum LDH level (P/S LDH), pleural fluid adenosine deaminase (PF-ADA) levels, and N-terminal pro–brain natriuretic peptide (NT-pro-BNP) levels had a significant impact on the identification of cardiac effusions, and those were simultaneously analyzed by multivariate regression analysis. The area under the curve (AUC) value of the model was 0.953. The model also had higher discriminatory properties than protein gradients (AUC, 0.760) and NT-pro-BNP (AUC, 0.906), all at a *P* value of <.01.

Conclusion

In cases of suspected cardiac effusion, or where clinicians cannot identify the cause of an exudative effusion, this model may assist in the correct identification of exudative effusions as cardiac effusions.

Hypoxia-Induced TGFBI as a Serum Biomarker for Laboratory Diagnosis and Prognosis in Patients with Pancreatic Ductal Adenocarcinoma

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Link dokumen ProQuest

ABSTRAK (ENGLISH)

Objective

To explore novel biomarkers for patients with pancreatic ductal adenocarcinoma (PDAC), from the perspective of tumor hypoxia.

Methods

We screened 29 differentially expressed and hypoxia-upregulated genes from the Oncomine database. A total of 12 secretory proteins that interact with hypoxia-inducible factor 1 (HIF-1A) were selected by STRING (protein-protein interaction networks). After excluding enzymes and collagens, insulin-like growth factor-binding protein 3 (IGFBP3), glycoprotein NBM (GPNMB), transforming growth factor–β-induced (TGFBI), and biglycan (BGN) were detected by sandwich enzyme-linked immunosorbent assay (ELISA) in patients with cancer and healthy control individuals.

Results

The serum level of TGFBI was significantly elevated in patients with PDAC, compared with healthy controls; the assay could discriminate among cases of PDAC in different clinical stages. The amount of TGFBI was significantly decreased after treatment. The combination of TGFBI and cancer antigen (CA) 19-9 was more accurate than TGFBI or CA 19-9 alone as diagnostic markers. Also, TGFBI might be used as a prognostic marker according to the PROGgeneV2 Pan Cancer Prognostics Database.

Conclusions

Serum TGFBI, combined with CA 19-9, offers higher diagnostic value than other methods for patients with PDAC. Also, TGFBI might be used as a prognostic marker.

Dokumen 43 dari 44

Elevated Lipase in an Infant with Altered Mental Status

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Link dokumen ProQuest

ABSTRAK (ENGLISH)

The pancreatic enzymes lipase and amylase serve important functions in digestion/absorption of fats and polysaccharides. Measurement of these enzymes is often used in the emergency department to rule out acute

pancreatitis in patients with nonspecific abdominal pain. In acute pancreatitis, serial measurements of plasma lipase and amylase typically follow a predictable temporal pattern of rise-and-fall kinetics: lipase levels rise within 4 to 8 hours, crest at 2× to 50× the upper reference limit at 24 hours, and decline to normal concentrations in 7 to 14 days. In situations in which the duration and magnitude of pancreatic enzyme elevation are more transient, clinicians should consider alternative causes for enzyme elevation. In this case report, incidental discovery of elevated lipase in an African American baby girl who ingested oxycodone resulted in additional laboratory and radiological work-up. Stronger awareness of exogenous influences on gastrointestinal motility may have prevented the need for further testing in this patient.

3D-Printing to Address COVID-19 Testing Supply Shortages

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ABSTRAK (ENGLISH)

The recent SARS-CoV-2 outbreak has placed immense pressure on supply chains, including shortages in nasopharyngeal (NP) swabs. Here, we report our experience of using 3D-printing to rapidly develop and deploy custom-made NP swabs to address supply shortages at our healthcare institution.

Daftar Pustaka

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Guo, G., Sun, M., Li, Y., Yang, W., Wang, X., Yu, Z., . . . Sun, C. (2023). Serum ferritin has limited prognostic value on mortality risk in patients with decompensated cirrhosis: A propensity score matching analysis. Labmedicine, 54(1), 47-55. doi:https://doi.org/10.1093/labmed/lmac064

Objective The prognostic value of serum ferritin remains elusive in the literature. We aimed to examine the association between serum ferritin and mortality risk in cirrhosis. Methods A total of 257 cirrhotic patients were recruited. The cut-off of serum ferritin was determined by X-tile. The Cox regression and Kaplan-Meier method were used. A 1:1 propensity score matching (PSM) was performed to diminish the impacts of selection bias and possible confounders. Results The difference regarding mortality was mostly significant for serum ferritin >158 ng/mL. Before PSM, serum ferritin >158 ng/mL was an independent predictor of mortality. However, the clinical relevance of high ferritin level for prognostication was blunted after PSM (survival rate: 86.8% vs 96.3%, P = .078). Cox regression indicated that model for end-stage liver disease remains only independent risk factor of 180-day mortality after PSM. Conclusion Serum ferritin may not serve as an independent prognostic indicator of mortality risk in decompensated cirrhotic patients.

Gaab, M. E., Prim, O. L., Ibañez, D., Korina, D. M., Fatima, M. R., Tiongco, R. E., & Albano, P. M. (2023). A meta-analysis on the association of colibactin-producing pks+ escherichia coli with the development of colorectal cancer. Labmedicine, 54(1), 75-82. doi:https://doi.org/10.1093/labmed/lmac072

Objective Previous studies on the association between pks+Escherichia coli and colorectal cancer (CRC) demonstrated conflicting results. Hence, we performed a meta-analysis to obtain more precise estimates. Methods Related literature was obtained from PubMed, ScienceDirect, Google Scholar, and Cochrane Library. Data were then extracted, summarized, and subjected to analysis using Review Manager 5.4 by computing for the pooled odds ratios at the 95% confidence interval. Results Overall analysis showed that individuals carrying pks+E coli had a greater risk of developing CRC. Subgroup analysis further showed that individuals from Western countries carrying pks+E coli and individuals with pks+E coli in their tissue samples had increased risk of developing CRC. Conclusion Results of this meta-analysis suggest that individuals with pks+E coli have a greater risk of developing CRC. However, more studies are needed to confirm our claims.

Che, G., Liu, F., Chang, L., Lai, S., Teng, J., & Yang, Q. (2023). Mycoplasma hominis meningitis diagnosed by metagenomic next-generation sequencing in a preterm newborn: A case report and literature review. Labmedicine, 54(1), e24-e28. doi:https://doi.org/10.1093/labmed/lmac078

Mycoplasma hominis is mainly colonized in the genital tract and vertically transmitted to newborns; however, it rarely causes neonatal meningitis. We report a case of M. hominis meningitis in a premature infant. She was admitted to our hospital for treatment after 6 days of repeated fever. After admission, repeated cerebrospinal fluid (CSF) analysis showed that leukocytes and protein in CSF increased substantially and glucose decreased, but there was no growth in conventional CSF culture. The patient was diagnosed with M. hominis meningitis by metagenomic next-generation sequencing (mNGS). The antibiotic therapy used for the neonate was meropenem, vancomycin, and ampicillin against bacterial infection and azithromycin against mycoplasma infection. The child was subsequently considered cured and discharged from the hospital and followed up regularly in the neurology clinic. The mNGS may be a promising and effective diagnostic technique for identifying uncommon pathogens of meningitis in patients with meningitis symptoms and signs without microbial growth in routine CSF culture.

Fadaei, R., Samaneh, M. A., Laher, I., & Khazaie, H. (2023). Increased levels of ANGPTL3 and CTRP9 in patients with obstructive sleep apnea and their relation to insulin resistance and lipid metabolism and markers of endothelial dysfunction. Labmedicine, 54(1), 83-89. doi:https://doi.org/10.1093/labmed/lmac073

Objective Obstructive sleep apnea (OSA) has a close relation with obesity and perturbation in adipokines and hepatokines, which are linked to OSA consequences such as insulin resistance, dyslipidemia, and endothelial

dysfunction. This study aimed to assess the relation of C1q/TNF-related protein 9 (CTRP9) and angiopoietin-like protein 3 (ANGPTL3) with OSA and biochemical measurements. Methods Serum levels of ANGPTL3, CTRP9, adiponectin, leptin, intercellular adhesion molecule 1 (ICAM-1), and vascular cell adhesion protein 1 (VCAM-1) were determined in 74 OSA patients and 27 controls using enzyme-linked immunosorbent assay kits. Results Levels of ANGPTL3, CTRP9, leptin, ICAM-1, and VCAM-1 were increased in the patients compared to the controls, whereas adiponectin levels decreased. ANGPTL3 had a positive correlation with total cholesterol, triglyceride, low-density lipoprotein cholesterol, ICAM-1, and VCAM-1 and was inversely correlated with leptin. CTRP9 showed a positive correlation with body mass index, insulin resistance, ICAM-1, and VCAM-1. Conclusion The results indicated the relation of ANGLTP3 and CTRP9 with OSA and its complications, which suggested a possible role for these factors in the consequences of OSA.

Shi, J., Li, W., Tao, R., Zhou, D., Guo, Y., Fu, H., . . . Mao, J. (2023). Association of catalase gene polymorphisms with idiopathic nephrotic syndrome in a chinese pediatric population. Labmedicine, 54(1), 35-40. doi:https://doi.org/10.1093/labmed/lmac062

Objective Our aim was to investigate the association between gene polymorphisms in catalase (CAT), a well-known oxidative stress regulator, and susceptibility to idiopathic nephrotic syndrome (INS) or responses to steroid therapy in a Chinese pediatric population. Methods We analyzed 3 CAT single-nucleotide polymorphisms (SNVs; rs7943316, rs769217, and rs12270780) using multi-polymerase chain reaction combined with next-generation sequencing in 183 INS patients and 100 healthy controls. Results For the allele and genotype frequencies of the CAT SNVs, no significant differences were observed between INS patients and controls. Patients with C allele of CAT rs769217 had a higher risk of developing steroid-dependent nephrotic syndrome than the steroid-sensitive nephrotic syndrome patients (P = 0.018; odds ratio = 1.76). Conclusion Our data suggests that genetic variations in CAT were unlikely to confer susceptibility to INS in Chinese children, whereas the C allele of the CAT rs769217 polymorphism showed a strong association with steroid-dependent responses in Chinese INS children.

Baba, H., Bouqdayr, M., Saih, A., Bensghir, R., Ouladlahsen, A., Sodqi, M., . . . Wakrim, L. (2023). Association between methylene-tetrahydrofolate reductase C677T polymorphism and human immunodeficiency virus type 1 infection in morocco. Labmedicine, 54(1), 23-29. doi:https://doi.org/10.1093/labmed/lmac081

Human immunodeficiency virus type 1 (HIV-1) infection varies substantially among individuals. One of the factors influencing viral infection is genetic variability. Methylenetetrahydrofolate reductase (MTHFR) C677T polymorphism is a genetic factor that has been correlated with different types of pathologies, including HIV-1. The MTHFR gene encodes the MTHFR enzyme, an essential factor in the folate metabolic pathway and in maintaining circulating folate and methionine at constant levels, thus preventing the homocysteine accumulation. Several studies have shown the role of folate on CD4+ T lymphocyte count among HIV-1 subjects. In this case-control study we aimed to determine the association between the MTHFR C677T polymorphism and HIV-1 infection susceptibility, AIDS development, and therapeutic outcome among Moroccans. The C677T polymorphism was genotyped by polymerase chain reaction followed by fragment length polymorphism digestion in 214 participants living with HIV-1 and 318 healthy controls. The results of the study revealed no statistically significant association between MTHFR C677T polymorphism and HIV-1 infection (P > .05). After dividing HIV-1 subjects according to their AIDS status, no significant difference was observed between C677T polymorphism and AIDS development (P > .05). Furthermore, regarding the treatment response outcome, as measured by HIV-1 RNA viral load and CD4+ T cell counts, no statistically significant association was found with MTHFR C677T polymorphism. We conclude that, in the genetic context of the Moroccan population, MTHFR C677T polymorphism does not affect HIV-1 infection susceptibility, AIDS development, or response to treatment. However, more studies should be done to investigate both genetic and nutritional aspects for more conclusive results.

Jacobs, J. W., Horstman, E., Gisriel, S. D., Tormey, C. A., & Sostin, N. (2023). Incidental discovery of a patient with the bombay phenotype. Labmedicine, 54(1), e14-e17. doi:https://doi.org/10.1093/labmed/lmac075

Bombay phenotype, an exceptionally rare blood type in individuals outside of Southeast Asia, occurs in approximately 1 in 1,000,000 individuals in Europe. This blood phenotype is characterized by the absence of the H antigen on red blood cells (RBCs) and in secretions. As the H antigen is the structure on which the ABO system is built, individuals lacking this antigen are unable to produce A or B antigens and appear as type O on routine ABO phenotyping. H deficiency does not cause ill effect; however, these individuals produce an anti-H alloantibody capable of causing severe acute hemolytic transfusion reactions when exposed to RBCs that express the H antigen. In this case study, we highlight the incidental discovery of a patient with Bombay phenotype in a North American hospital system, expected test results, the immunologic and genetic basis underlying the Bombay and para-Bombay phenotypes, and methods to ensure availability of compatible blood.

About the journal. (2023). Labmedicine, 54(1), 1. doi:https://doi.org/10.1093/labmed/lmac144

Noulsri, E., & Lerdwana, S. (2023). Blood donors with thalassemic trait, glucose-6-phosphate dehydrogenase deficiency trait, and sickle cell trait and their blood products: Current status and future perspective. Labmedicine, 54(1), 6-12. doi:https://doi.org/10.1093/labmed/lmac061

The use of blood products for different medical purposes has increased in recent years. To meet increasing demand, some blood centers allow volunteer donors with thalassemic trait, glucose-6-phosphate dehydrogenase deficiency (G6PD) trait, and sickle cell trait (SCT) to donate blood if their hemoglobin values fall within acceptable ranges and show no signs of hemolysis. Currently, there are no standard guidelines or policies regarding the use or management of blood products obtained from these donors. However, in recent years, there has been advanced research on eligible donors who have these underlying conditions. In this review, we summarize the current knowledge from in vitro and in vivo studies regarding donor characteristics, changes in physical and biochemical parameters in blood products during processing and storage, and posttransfusion efficacy of blood products. In addition, we discuss some unresolved issues concerning blood products from thalassemic trait, G6PD-deficiency trait, and SCT donors.

McPherson, P. A. C., McClements, O. S., & Johnston, B. M. (2023). Pourbiax diagrams as an aid to understanding the impact of Acid/Base disturbance on blood glucose point-of-care testing. Labmedicine, 54(1), 72-74. doi:https://doi.org/10.1093/labmed/lmac069

Objective Assays based on redox reactions that involve proton transfer are vulnerable to artifactual findings in metabolic acidosis/alkalosis. We evaluated the impact of pH on the measurement of blood glucose by the glucose dehydrogenase/pyrroloquinoline quinone system used in point-of-care-testing. Methods We applied a series of thermodynamic equations to adjust the Gibbs energy for the pyrroloquinoline quinone couple. This adjusts values taken under standard conditions to those more closely resembling the physiological state. Results Under standard conditions, the pyrroloquinoline quinone couple has Eo = −0.125 V whereas adjustment to the physiological state (pH 7.40, ionic strength 0.15 mol/L, and temperature 310.15°K) yields Eo′ = −0.166 V. This corresponds to an uncertainty in blood glucose determination of approximately 0.13 mmol/L. Conclusion We have demonstrated that the impact of pH on blood glucose determination by the glucose dehydrogenase/pyrroloquinoline quinone system (under physiologically relevant conditions of ionic strength and temperature) is not clinically significant.

Zeng, Z., Guo, H., Chen, L., Lin, Z., Guan, W., Wang, Y., . . . Yang, Z. (2023). Culturing severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) for diagnosis and genome sequencing. Labmedicine, 54(1), 30-34. doi:https://doi.org/10.1093/labmed/lmac060

Objective The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) nucleic acid detection “re-positive” phenomenon is encountered clinically. The accuracy of a viral nucleic acid test is crucial to prevent reintroduction of the virus into the community. This study evaluated the effect of virus culturing on increasing the sensitivity and specificity of real-time polymerase chain reaction (RT-PCR) detection and viral genomic sequencing. Methods A series of tenfold dilutions of a SARS-CoV-2 viral stock were conducted and cultured for either 24 or 48 hours. The viral load of cultured samples was determined by RT-PCR. The cultured and non-cultured samples of 1x 50% tissue culture infectious dose (TCID50) were sequenced using metagenomic next-generation sequencing. The depth and

coverage of SARS-CoV-2 genome were measured. Results The lowest viral load detectable in a sample with RT-PCR was 0.01 TCID50. After a 24-h culture, the viral ORF 1ab and N-gene cycle threshold (CT) values were reduced by 4.4 points and 1 point, respectively. One TCID50 viral load of post 24-h culture revealed the sequence depth reached an average of 752 reads, compared with 0.15 in the nonculture; furthermore, the coverage was 99.99% while 6.42% in the nonculture. Conclusion These results indicate that virus culturing can significantly increase the viral load, which can increase the certainty of true-positive detection of the viral nucleic acids, and improve the quality of virus genomic sequencing.

Omar, C. P., Peker, D., Zhang, L., & Papadantonakis, N. (2023). Essential thrombocythemia and post-essential thrombocythemia myelofibrosis: Updates on diagnosis, clinical aspects, and management. Labmedicine, 54(1), 13-22. doi:https://doi.org/10.1093/labmed/lmac074

Although several decades have passed since the description of myeloproliferative neoplasms (MPN), many aspects of their pathophysiology have not been elucidated. In this review, we discuss the mutational landscape of patients with essential thrombocythemia (ET), prognostic scores and salient pathology, and clinical points. We discuss also the diagnostic challenges of differentiating ET from prefibrotic MF. We then focus on post-essential thrombocythemia myelofibrosis (post-ET MF), a rare subset of MPN that is usually studied in conjunction with post-polycythemia vera MF. The transition of ET to post-ET MF is not well studied on a molecular level, and we present available data. Patients with secondary MF could benefit from allogenic hematopoietic stem cell transplantation, and we present available data focusing on post-ET MF.

Zou, K., Du, Q., Chen, X., Tang, P., & Liang, H. (2023). MLL1:EZH2 ratio in uterine secretions and endometrial receptivity in patients with endometriosis. Labmedicine, 54(1), 90-97. doi:https://doi.org/10.1093/labmed/lmac067

Objective To establish a novel approach for diagnosing endometriosis (EM) in patients with impaired endometrial receptivity. Method Mixed lineage leukemia 1 (MLL1) and enhancer of zeste homolog 2 (EZH2) levels were analyzed. The MLL1:EZH2 ratio in identifying impaired endometrial receptivity has been established and validated. Results In normal endometrial tissue, the MLL1:EZH2 ratio increased significantly in the midsecretory phase, compared with that in the proliferative phase. In the midsecretory phase, the MLL1:EZH2 ratio in endometrial tissues and uterine secretions accurately identifies patients with EM who have impaired endometrial receptivity. In the validation group, the sensitivity and specificity of the MLL1:EZH2 ratio in the uterine secretions of the midsecretory phase, in diagnosing patients EM who have impaired endometrial receptivity, were 100% and 96.55%, respectively. Conclusions The MLL1:EZH2 ratio in uterine secretions of the midsecretory phase may serve as a marker to diagnose EM in patients with impaired endometrial receptivity.

Carbonaro, C. A., Isabella, D., & Faisal, H. R. (2023). Coping with the COVID-19 pandemic: How a Master's in clinical laboratory sciences program adapted through the modification of existing resources. Labmedicine, 54(1), e29-e30. doi:https://doi.org/10.1093/labmed/lmac086

Objective Our aim was to describe the rapid adaption of a Master of Clinical Laboratory Sciences (MCLS) program to the abrupt suspension of classroom instruction and laboratory training at affiliated hospitals in compliance with the New York governor's executive order in March 2020. Methods Teaching modifications included greater emphasis on Zoom video conferencing, Media Lab assignments, independent self-study, and online testing. Results Instruction of academic coursework continued uninterrupted using previously established teaching modalities. Clinical training presented 2-fold concerns, credit hours needed for the master's degree and clinical hours required for New York State licensing. The latter was delayed. Conclusion The real-time need to deliver laboratory science education during a time of statewide closure was fulfilled using available teaching modalities. The resulting uninterrupted academic and clinical training ensured the education of the incoming workforce of our clinical laboratories. This teaching strategy may be considered during new curricula development in preparation for times of future crises.

Halstead, D. C., & Sautter, R. L. (2023). A literature review on how we can address medical laboratory scientist staffing shortages. Labmedicine, 54(1), e31-e36. doi:https://doi.org/10.1093/labmed/lmac090

Objective Laboratories are facing a critical shortage of medical laboratory scientists (MLS) and medical laboratory technicians (MLT) to address an increasing demand for laboratory testing. Training program closures, fewer student applicants, and financial decisions have contributed to staffing shortages. Lack of visibility, low wages, and perceived lack of opportunities for upward career mobility contribute to challenges in recruiting and retaining qualified individuals and students who are unaware of laboratory medicine careers. Our goal was to review the literature to determine the current state and consequences of staffing shortages, and potential solutions to address these shortages. Methods Medline/PubMed, PubMed Central, MeSH, Google Scholar, and Marshall Digital Scholar were used as resources. Discussion/Conclusions A collaboration of stakeholders is needed to identify staffing challenges, barriers, and solutions and to increase visibility of laboratory professionals. Early recruitment is best started in the middle and high school educational process.

Angeletti, S., Legramante, J. M., Lia, M. S., Loreta D'Amico, Fogolari, M., Cella, E., . . . Minieri, M. (2023). Assessment of the stability of midregional proadrenomedullin in different biological matrices. Labmedicine, 54(1), 41-46. doi:https://doi.org/10.1093/labmed/lmac066

Midregional proadrenomedullin (MR-proADM) has been shown to play a key role in endothelial dysfunction, with increased levels helping to prevent early stages of organ dysfunction. Recent clinical evidence has demonstrated MR-proADM to be a helpful biomarker to identify disease severity in patients with sepsis as well as pneumonia. This biomarker is helpful at triage in emergency departments to assess risk level of patients. The aim of this study is to evaluate the stability of MR-proADM in different biological matrices. The results, obtained by Bland-Altman and scatter plot analyses, demonstrate that deviation of MR-proADM concentration in serum compared to EDTA plasma unequivocally shows that serum should not be used as a sample matrix. Instead, the excellent correlation of heparin plasma vs EDTA plasma samples shows that heparin plasma can be used without reservation in clinical routine and emergency samples.

Wang, Q., Xu, F., Chen, J., Yan-Qing Xie, Su-Ling, X., & Wen-Ming, H. (2023). Serum leukocyte cell-derived chemotaxin 2 (LECT2) level is associated with osteoporosis. Labmedicine, 54(1), 106-111. doi:https://doi.org/10.1093/labmed/lmac080

Objective The aim of this study was to examine serum leukocyte cell-derived chemotaxin 2 (LECT2) levels in osteoporosis subjects to confirm its association with osteoporosis. Methods A total of 204 adult subjects were recruited. Bone mineral densities (BMD) were assessed and blood samples were collected for measurements of biomedical parameters and the bone turnover markers. Serum LECT2 levels were measured by enzyme-linked immunosorbent assay. The relationships between serum LECT2 levels and other parameters were analyzed using the Spearman correlation coefficient. Results Serum LECT2 levels were significantly increased in osteoporosis subjects over controls. We found a significantly negative correlation of serum LECT2 with BMD, 25-hydroxy-vitamin D, and creatinine and a significantly positive correlation with C-terminal telopeptide of type 1 collagen and total cholesterol. Conclusion Serum LECT2 levels were significantly upregulated in osteoporosis subjects and correlated with the severity of bone loss. Serum LECT2 could be a potential biomarker to assess the risk of bone loss.

Atwoli, L., Erhabor, G. E., Gbakima, A. A., Haileamlak, A., Jean-Marie, K. N., Kigera, J., . . . Zielinski, C. (2023). COP27 climate change conference: Urgent action needed for africa and the world: Wealthy nations must step up support for africa and vulnerable countries in addressing past, present and future impacts of climate change †. Labmedicine, 54(1), 3-5. doi:https://doi.org/10.1093/labmed/lmac142

Petersen, J. M., & Jhala, D. N. (2023). Compliance with the current NCCN guidelines and its critical role in pancreatic adenocarcinoma. Labmedicine, 54(1), e1-e9. doi:https://doi.org/10.1093/labmed/lmac046

Objectives Since 2019, the National Comprehensive Cancer Network (NCCN) has recommended genetic testing for patients diagnosed with pancreatic adenocarcinoma that includes universal germline testing and tumor gene profiling for metastatic, locally advanced, or recurrent disease. However, testing compliance with this guideline has not yet been published in the English literature. Methods A quality assurance/quality improvement retrospective review was done to identify patients diagnosed with pancreatic adenocarcinoma from January 2019 to February

2021 to include the patient's clinical status and genetic test results. Results There were 20 patient cases identified with pancreatic adenocarcinoma. A total of 11 cases had molecular tumor gene profiling and microsatellite instability/mismatch repair (MSI/MMR) testing performed and 1 case had only MSI/MMR testing by immunohistochemistry performed. Only 3 patients of the 20 in total received germline testing. Conclusion There was a significant number of patients for whom tumor gene profiling or germline testing had never been attempted as per recommended NCCN guidelines.

Zhang, M., Lin, Z., Chen, M., Pan, Y., Zhang, Y., Chen, L., . . . Huang, H. (2023). Application of the single-molecule real-time technology (SMRT) for identification of HKαα thalassemia allele. Labmedicine, 54(1), 65-71. doi:https://doi.org/10.1093/labmed/lmac065

Objective Single-molecule real-time technology (SMRT) is a sequencing technology using the DNA polymerases and fluorescently tagged nucleotides to accurately sequence DNA strands. The purpose of this study was to evaluate the detection accuracy of SMRT for identification of the Hong Kongαα (HKαα) thalassemia allele. Methods We conducted a blinded study of 33 samples of known HKαα alleles. These alleles were detected using SMRT to evaluate accuracy. Results We conducted a blinded study of 33 known HKαα samples and found all HKαα variants detected by SMRT to be concordant with those independently assigned by gap-polymerase chain reaction (gap-PCR), reverse dot blot hybridization, and 2-round nested PCR. In addition, SMRT detected 2 β-thalassemia variants that were missed by conventional techniques. Conclusion The results demonstrate that SMRT offers a higher detection accuracy of thalassemia rare and new loci. It is an efficient, reliable, and broad-spectrum test that can be widely used for thalassemia screening in the clinic.

VanSpronsen, A. D., Zychla, L., Turley, E., Villatoro, V., Yuan, Y., & Ohinmaa, A. (2023). Causes of inappropriate laboratory test ordering from the perspective of medical laboratory technical professionals: Implications for research and education. Labmedicine, 54(1), e18-e23. doi:https://doi.org/10.1093/labmed/lmac076

Objective Inappropriate laboratory test ordering is a significant and persistent problem. Many causes have been identified and studied. Medical laboratory professionals (MLPs) are technical staff within clinical laboratories who are uniquely positioned to comment on why inappropriate ordering occurs. We aimed to characterize existing MLP perceptions in this domain to reveal new or underemphasized interventional targets. Methods We developed and disseminated a self-administered survey to MLPs in Canada, including open-ended responses to questions about the causes of inappropriate laboratory test ordering. Results Four primary themes were identified from qualitative analysis: ordering-provider factors, communication factors, existing test-ordering processes, and patient factors. Although these factors can largely be found in previous literature, some are under-studied. Conclusion MLP insights into nonphysician triage ordering and poor result communication provide targets for further investigation. A heavy focus on individual clinician factors suggests that current understandings and interprofessional skills in the MLP population can be improved.

Li, Y., Xun-Jie Cao, Luo, X., Tian-Ao Xie, Wan-Jun, L., Shi-Ming, X., . . . Xu-Guang Guo. (2023). Evaluation of RT-LAMP assay for rapid detection of SARS-CoV-2. Labmedicine, 54(1), 56-64. doi:https://doi.org/10.1093/labmed/lmac030

Objective To evaluate the accuracy of the reverse transcription loop-mediated isothermal amplification (RT-LAMP) assay for rapid detection of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in community or primary-care settings. Method We systematically searched the Web of Science, Embase, PubMed, and Cochrane Library databases. We conducted quality evaluation using ReviewManager software (version 5.0). We then used MetaDisc software (version 1.4) and Stata software (version 12.0) to build forest plots, along with a Deeks funnel plot and a bivariate boxplot for analysis. Result Overall, the sensitivity, specificity, and diagnostic odds ratio were 0.79, 0.97, and 328.18, respectively. The sensitivity for the subgroup with RNA extraction appeared to be higher, at 0.88 (0.86–0.90), compared to the subgroup without RNA extraction, at 0.50 (0.45–0.55), with no significant difference in specificity. Conclusion RT-LAMP assay exhibited high specificity regarding current SARS-CoV-2 infection. However, its overall sensitivity was relatively moderate. Extracting RNA was found to be beneficial in

improving sensitivity.

Deng, J., Xie, S., Chen, Y., Ma, Q., He, Y., Liu, M., . . . Yu, X. (2023). Application of the fluorescence method on sysmex XN9000 hematology analyzer for correcting platelet count in individuals with microcytosis. Labmedicine, 54(1), e10-e13. doi:https://doi.org/10.1093/labmed/lmac063

Objective Although small red blood cells are a well-known analytical pitfall that could cause artifactual increase of the platelet count, limited information is available on the accuracy of impedance platelet counting in cases with microcytosis. The aim of this study is to assess the accuracy of impedance platelet counting in the presence of small red blood cells, and to establish the optimal mean corpuscular volume (MCV) cutoff to endorse fluorescence platelet counting. Methods In this study, platelet counts estimated by the impedance method on the Sysmex XN9000 analyzer (Sysmex, Kobe, Japan) were compared with those provided by the fluorescence method. The accuracy of impedance platelet counting was assessed. Receiver operating characteristic curve was used to evaluate the performance of MCV in predicting falsely increased platelet counts. Results There was a tendency for the impedance method to overestimate the platelet count in samples with 70 fL < MCV ≤ 80 fL, 60 fL < MCV ≤ 70 fL, MCV ≤ 60 fL. Receiver operating characteristic curve analysis showed that a 73.5fL cutoff of MCV was highly sensitive in predicting falsely increased platelet counts. Conclusion In cases with MCV < 73.5 fL, we strongly suggest that the platelet counts obtained by the impedance method on the Sysmex XN9000 analyzer should be checked and corrected by fluorescence counting.