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DAFTAR ISI

1. Efficacy of POC Antibody Assays after COVID-19 Infection and Potential Utility for “Immunity Passports”	1
2. Gas Chromatography Mass Spectrometry Aided Diagnosis of Glutathione Synthetase Deficiency.....	1
3. Urine Organic Acid Analysis: Key Diagnostic Test for Fumaric Aciduria in a Sri Lankan Child.....	2
4. Validation of an In-House-Developed GC-MS Method for 5 α -Cholestanol According to ISO 15189:2012 Requirements.....	2
5. Variations in Nomenclature of Clinical Variants between Annotation Tools.....	3
6. Elevated Serum HE4 Concentrations and Risk of Cardiac Complications among Hospitalized Patients with Burns.....	4
7. Kanamycin Supplement for the Disaggregation of Platelet Clumps in EDTA-Dependent Pseudothrombocytopenia Specimens.....	5
8. Corrigendum to: Urine Organic Acid Analysis: Key Diagnostic Test for Fumaric Aciduria in a Sri Lankan Child.....	6
9. The Relationship of Thyroid Functions with ADMA, IMA, and Metabolic Laboratory Parameters in Euthyroid Adults with and without Autoimmune Thyroiditis.....	6
10. The Impact of Sodium Dodecyl Sulfate and 2-Mercaptoethanol on Antibody and Antigen Binding.....	7
11. Storage Duration and Red Blood Cell-Derived Microparticles in Packed Red Blood Cells Obtained from Donors with Thalassemia.....	8
12. Is Cryoprecipitate-Reduced Plasma an Efficacious Replacement Fluid for Therapeutic Plasma Exchange for Patients with Thrombotic Microangiopathy? A Single-Center Retrospective Experience.....	9
13. A Simplified Protocol for Microsatellite Instability Evaluation in Iranian Patients at Risk for Lynch Syndrome.....	10
14. Quantitative Detection of Anti-SARS-CoV-2 Antibodies Using Indirect ELISA.....	11
15. Semaphorin 3A Levels in Lupus with and without Secondary Antiphospholipid Antibody Syndrome and Renal Involvement.....	11
16. Acute Promyelocytic Leukemia with a BCR-ABL1 Rearrangement in a Minor Clone.....	13
17. A Scoping Review of Medical Laboratory Science and Simulation: Promoting a Path Forward with Best Practices.....	13
18. Adequate Antibody Response to COVID-19 Vaccine in Patients with Monoclonal Gammopathies and Light Chain Amyloidosis.....	14
19. Protocols to Dissolve Amorphous Urate Crystals in Urine.....	15
20. Influence of Tacrolimus on Serum Vitamin A Levels in Patients after Renal Transplantation.....	16
21. A UFLC-MS/MS Method for the Simultaneous Analysis of Urinary Podocin and Podocalyxin in Patients with Nephrotic Syndrome.....	16
22. Relationships Between Circulating Tenascin-C Levels and Gonadal Hormones in Male Patients with Depressive Disorder: A Retrospective, Cross-Sectional Study.....	17
23. Novel Methods for Detecting Human Cholesterol Crystals from Sampled Blood.....	18
Daftar Pustaka.....	20

Efficacy of POC Antibody Assays after COVID-19 Infection and Potential Utility for “Immunity Passports”

Shalaby, Akram ¹ ; Laharwani, Hansini ¹ ; Bates, John T ¹ ; Kyle, Patrick B ^{1 1} University of Mississippi Medical Center , Jackson, Mississippi , US

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ABSTRAK (ENGLISH)

Objective

Numerous manufacturers market lateral flow assays for the detection of SARS-CoV-2 antibodies, but there are many questions about the reliability and efficacy of these tests.

Materials and Methods

Serum specimens from 60 individuals were analyzed using 2 lateral flow antibody assays, an in-house enzyme-linked immunosorbent assay (ELISA), and the Abbott SARS-CoV-2 IgG chemiluminescent immunoassay.

Results

The BioMedomics and Premier Biotech lateral flow assays were positive for IgM in 73.3% and 70% and for IgG in 80% and 73.3% of specimens, respectively. The ELISA assay was positive for IgM and IgG in 73.3% and 86.7% of specimens from infected individuals, whereas the Abbott assay was positive in 80%. The specificities of the 4 assays ranged from 96.7% to 100% for IgM and from 93.3% to 100% for IgG.

Conclusion

Results of the 2 lateral flow assays were comparable to those of the ELISA and Abbott assays. Assay efficacy depended on length of time after SARS-CoV-2 infection.

Gas Chromatography Mass Spectrometry Aided Diagnosis of Glutathione Synthetase Deficiency

Kaur, Parminder ¹ ; Chaudhry, Chakshu ¹ ; Panigrahi, Inusha ¹ ; Srivastava, Priyanka ¹ ; Kaur, Anupriya ^{1 1} Genetic Metabolic Unit, Department of Pediatrics, Advanced Pediatrics Centre, Post Graduate Institute of Medical Education and Research (PGIMER) , Chandigarh , India

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ABSTRAK (ENGLISH)

Glutathione synthetase (GSS) deficiency is a rare disorder, occurring with a frequency of less than 1 in 100,000 individuals worldwide. The clinical presentation may vary from mild to severe, and manifestations include hemolytic anemia, hyperbilirubinemia, metabolic acidosis, neurological problems, and sepsis. Herein, we present a case of a newborn boy with the most severe phenotype of GSS deficiency, diagnosed based on clinical features and increased urinary 5-oxoproline levels determined via gas chromatography mass spectrometry (GCMS) testing.

Dokumen 3 dari 23

Urine Organic Acid Analysis: Key Diagnostic Test for Fumaric Aciduria in a Sri Lankan Child

Jasinge, Eresha ¹ ; Mihika Fernando ¹ ; Indika, Neluwa-Liyanage R ² ; Trunzo, Roberta ³ ; Schröder, Sabine ³ ; Vidanapathirana, Dinesha Maduri ⁴ ; Jones, Patricia M ⁵ ; Jayasena, Subashini ¹ ; Gunarathne, Anusha Varuni ¹ ; Ratnayake, Pyara ⁶ ¹ Department of Chemical Pathology, Lady Ridgeway Hospital for Children , Colombo , Sri Lanka ² Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura , Nugegoda , Sri Lanka ³ CENTOGENE AG , Rostock , Germany ⁴ Department of Pathology, Faculty of Medical Sciences, University of Sri Jayewardenepura , Nugegoda , Sri Lanka ⁵ Department of Pathology, University of Texas Southwestern Medical Center and Children's Medical Center , Dallas, Texas , US ⁶ Neurology Unit, Lady Ridgeway Hospital for Children , Colombo , Sri Lanka

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ABSTRAK (ENGLISH)

Fumaric aciduria resulting from fumarate hydratase deficiency is a rare inherited disorder of the Krebs tricarboxylic acid cycle that is characterized by neurologic manifestations, a spectrum of brain abnormalities, and the excretion of fumaric acid in urine. We describe a 3 year old Sri Lankan boy who was referred at age 10 months with poor weight gain and hypotonia for further laboratory investigations. In addition to global developmental delay, there were noticeable dysmorphic features with a prominent forehead, low-set ears, micrognathia, and hypertelorism with persistent neutropenia. Urine organic acid assay revealed a massive elevation of fumaric acid on 2 occasions. Molecular analysis revealed a homozygous likely pathogenic missense variant, NM000143.3:c.1048C>T p. (Arg350Trp), in the *FH* gene, confirming the biochemical diagnosis. Our patient was the first patient in Sri Lanka molecularly diagnosed with fumaric aciduria. This case study highlights the importance of performing organic acid assays in children presenting with neurologic manifestations especially when these are suspected to have a metabolic basis.

Dokumen 4 dari 23

Validation of an In-House-Developed GC-MS Method for 5 α -Cholesterol According to ISO

15189:2012 Requirements

Coker, Canan ¹ ; Uysal, Sezer ^{1 1} Dokuz Eylül University Faculty of Medicine, Department of Biochemistry , Izmir , Turkey

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ABSTRAK (ENGLISH)

Objective

The aim of this study was to validate a gas chromatography-mass spectrometry (GC-MS) method for the measurement of 5 α -cholestanol in the clinical laboratory in agreement with ISO 15189:2012.

Materials and Methods

The GC-MS performance was evaluated and proficiency testing data were used to estimate the measurement uncertainty of the method considering the recommendations of international guidelines.

Results

The calibration curves were linear from 6 to 50 $\mu\text{mol/L}$, with $r^2 > .99$. The limit of detection and limit of quantitation were determined to be 0.36 and 2.58 $\mu\text{mol/L}$, respectively. The bias ranged from -18.9% to 15.2% for 6.5, 18.3, and 66 $\mu\text{mol/L}$. The intra- and interassay reproducibility was <20% at the various concentrations studied. The expanded uncertainty was determined to be 50.9%.

Conclusion

The GC-MS method for the measurement of 5 α -cholestanol has proved to have acceptable analytical performance for use in the clinical laboratory.

Dokumen 5 dari 23

Variations in Nomenclature of Clinical Variants between Annotation Tools

Kyoung-Jin, Park ¹ ; Jong-Ho, Park ^{2 1} Department of Laboratory Medicine & Genetics, Samsung Changwon Hospital, Sungkyunkwan University School of Medicine , Changwon , South Korea ² Department of Laboratory Medicine & Genetics, Samsung Medical Center , Seoul , South Korea

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ABSTRAK (ENGLISH)

Background

Accurate nomenclature of variants is an essential element for genetic diagnosis and patient care.

Objective

To investigate annotation differences of clinical variants between annotation tools.

Methods

We analyzed 218,156 clinical variants from the Human Gene Mutation Database. Multiple nomenclatures based on RefSeq transcripts were provided using ANNOVAR and snpEff.

Results

The concordance rate between ANNOVAR and snpEff was approximately 85%. Based on the Human Genome Variation Society (HGVS) nomenclature, snpEff was more accurate than ANNOVAR (coding variants, 99.3% vs 84.9%; protein variants, 94.3% vs 79.8%). When annotating each variant with ANNOVAR and snpEff, the accuracy of nomenclature was 99.5%.

Conclusions

There were substantial differences between ANNOVAR and snpEff annotations. The findings of this study suggest that simultaneous use of multiple annotation tools could decrease nomenclature errors and contribute to providing standardized clinical reporting.

Dokumen 6 dari 23

Elevated Serum HE4 Concentrations and Risk of Cardiac Complications among Hospitalized Patients with Burns

Wu, Yangyang¹; Cao, Ling¹; Qi, Jun¹¹ Department of Burns and Plastic Surgery, Affiliated Hospital of Nantong University, Nantong City, China

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ABSTRAK (ENGLISH)

Background

The decrease in effective blood volume after burns is closely related to abnormal heart function.

Objective

To investigate whether serum human epididymis protein 4 (HE4), an indicator of early renal injury, contributes to increased risk of cardiac complications in patients with burns.

Methods

Within 24 hours after hospital admission, clinical condition assessment and biochemical testing in patients with burns were performed. Multivariate analysis was performed by evaluating the relationship between serum HE4 levels and risk of cardiac complications (cardiac insufficiency, arrhythmia, and myocardial infarction) during hospitalization.

Results

The number (percentage) of cardiac complications in all included patients with burns was 80 (15.6%). The results of sensitivity analysis suggest that elevated serum HE4 levels were related to higher risk of cardiac complications in patients with sepsis (OR = 2.1; 95% CI, 1.19–3.17; $P < .001$) and in patients without sepsis (OR = 2.29; 95% CI, 1.33–4.71; $P = .005$), respectively, after adjustments for clinical confounding factors were made. Sepsis did not have a modification effect on the association between serum and cardiac complications among these patients. Also, the results of ROC curve analysis showed that serum HE4 levels have good predictive value for predicting cardiac complications in patients with burns (AUC = 0.708; 95% CI, 0.61–0.81; $P < .001$).

Conclusions

In the current study, we identified that elevated HE4 levels contributed to increased risk of cardiac complications in the hospital in patients with burns. This novel finding suggests that burn patients with serum HE4 may provide the opportunity to predict cardiac complications before hospital admission.

Dokumen 7 dari 23

Kanamycin Supplement for the Disaggregation of Platelet Clumps in EDTA-Dependent Pseudothrombocytopenia Specimens

Tantanate, Chaicharoen¹; Talabthong, Supavat¹; Lamyai, Phenluck^{1 1} Department of Clinical Pathology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkoknoi, Bangkok, Thailand

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ABSTRAK (ENGLISH)

Objective

To indicate the ability to disaggregate platelet clumps by vortex mixing and kanamycin supplementation in EDTA-dependent pseudothrombocytopenia (EDTA-PTCP) specimens.

Materials and Methods

For patients with EDTA-PTCP, citrate-anticoagulated, primary EDTA-anticoagulated, vortex-mixed, and kanamycin-treated specimens were tested for complete blood count and platelet-related parameters.

Results

Forty-eight specimens were included. Nineteen (39.6%) of the vortex-mixed specimens and 42 (87.5%) of the kanamycin-treated specimens revealed platelet counts more than those of the primary EDTA specimens, with levels exceeding $100 \times 10^9/L$. The platelet count and platelet recovery of the kanamycin-treated specimens were higher than those of the vortex-mixed specimens.

Conclusion

Kanamycin supplementation to EDTA-PTCP blood may be considered as an alternative approach when the recollection of specimens is impractical. Only platelet-related parameters from kanamycin treatment were suitable for guiding patient management. Further studies about the impact of these methods in patients with various conditions, such as in patients with advanced kidney disease, should be conducted.

Dokumen 8 dari 23

Corrigendum to: Urine Organic Acid Analysis: Key Diagnostic Test for Fumaric Aciduria in a Sri Lankan Child

Jasinge, Eresha ¹ ; Mihika Fernando ¹ ; Neluwa-Liyanage Ruwan Indika ² ; Trunzo, Roberta ³ ; Schröder, Sabine ³ ; Vidanapathirana, Dinesha Maduri ⁴ ; Jones, Patricia M ⁵ ; Jayasena, Subashini ¹ ; Gunarathne, Anusha Varuni ¹ ; Ratnayake, Pyara ⁶ ¹ Department of Chemical Pathology, Lady Ridgeway Hospital for Children , Colombo , Sri Lanka ² Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura , Sri Lanka ³ CENTOGENE AG , Rostock , Germany ⁴ Department of Pathology, Faculty of Medical Sciences, University of Sri Jayewardenepura , Sri Lanka ⁵ Department of Pathology, University of Texas Southwestern Medical Center and Children's Medical Center , Dallas, Texas , US ⁶ Neurology Unit, Lady Ridgeway Hospital for Children , Colombo , Sri Lanka

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Dokumen 9 dari 23

The Relationship of Thyroid Functions with ADMA, IMA, and Metabolic Laboratory Parameters in Euthyroid Adults with and without Autoimmune Thyroiditis

Cetin, Zeynep ¹ ; Kosem, Arzu ² ; Catak, Merve ³ ; Can, Bulent ⁴ ; Baser, Ozden ⁵ ; Guler, Serdar ⁶ ¹ Division of Endocrinology and Metabolism, Department of Internal Medicine, Amasya University Medicine Faculty , Amasya , Turkey ² Department of Clinical Biochemistry, University of Health Sciences, Ankara City Hospital , Ankara , Turkey (current affiliation: University of Health Sciences, Diskapi Education and Research Hospital, Ankara, Turkey) ³ Division of Endocrinology and Metabolism, Department of Internal

Medicine, Gaziosmanpaşa University Medicine Faculty , Tokat , Turkey ⁴ Division of Endocrinology and Metabolism, Department of Internal Medicine, Medeniyet University Medicine Faculty , Istanbul , Turkey ⁵ Department of Endocrinology and Metabolism, Yozgat City Hospital , Yozgat , Turkey ⁶ Department of Endocrinology and Metabolism, Liv Hospital , Ankara , Turkey

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ABSTRAK (ENGLISH)

Objective

To investigate the relationship between thyroid functions and asymmetric dimethylarginine (ADMA), ischemia-modified albumin (IMA), and other metabolic laboratory markers in euthyroid adults and whether narrower thyroidal targets are required for lower metabolic risk.

Materials and Methods

Thyroid functions, antithyroid autoantibodies, and metabolic parameters were measured for 115 patients. Forty-seven had autoimmune thyroiditis (AIT). Analyses were performed according to cutoff values of 1, 2, 2.5, and 3 mIU/L for thyrotropin, 0.84 ng/dL for free thyroxine (fT₄), and 3.59 ng/dL for free tri-iodothyronine (fT₃).

Results

There was no relationship between thyrotropin and fT₃ cutoff values and metabolic parameters. Only C-reactive protein was lower in the group with thyrotropin ≤ 2.5 μ IU/L. A weak positive correlation was found between fT₄ with IMA and IMA corrected for albumin ($r = 0.187$, $P = .05$; $r = 0.204$, $P = .034$, respectively). There was no difference between AIT and the metabolic laboratory parameters examined in the study.

Conclusion

This study is the first to evaluate ADMA in AIT. Narrower thyroid function targets are not required for better metabolic control in euthyroid adults.

Dokumen 10 dari 23

The Impact of Sodium Dodecyl Sulfate and 2-Mercaptoethanol on Antibody and Antigen Binding

Wang, Chong ¹ ; Liu, Hui ¹ ; Feng, Xinyan ¹ ¹ College of Medical Laboratory, Dalian Medical University , Dalian , China

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ABSTRAK (ENGLISH)

Objective

To evaluate the effect of sodium dodecyl sulfate (SDS) and 2-mercaptoethanol (2-ME) on antigen-antibody binding when incubated at 100°C, which is the pretreatment temperature required for western blots.

Methods

Serum that tested positive for hepatitis B surface antigen (HBsAg) plus loading buffer were mixed at a ratio of 4:1 and incubated in a water bath. We then detected HBsAg using double immunodiffusion and ELISA.

Results

The HBsAg titer was 1:512 in the control group when incubated at 37°C. Incubation with SDS at 100°C reduced the antigen titer to 1:32. The inhibitory effect on HBsAg titer reached 96.9% after incubation at 100°C with SDS and 2-ME.

Conclusion

We detected strong inhibition of antigens in western blots via SDS and 2-ME. It is likely that false-negative results will be obtained from western blots of antigens with weak resistance to these reagents.

Dokumen 11 dari 23

Storage Duration and Red Blood Cell–Derived Microparticles in Packed Red Blood Cells Obtained from Donors with Thalassemia

Noulsri, Egarit ¹ ; Lerdwana, Surada ² ; Palasuwan, Duangdao ³ ; Palasuwan, Attakorn ³ ¹ Research Division, Faculty of Medicine Siriraj Hospital, Mahidol University , Bangkok , Thailand ² Department of Research and Development, Faculty of Medicine Siriraj Hospital, Mahidol University , Bangkok , Thailand ³ Oxidation in Red Cell Disorders and Health Task Force, Department of Clinical Microscopy, Faculty of Allied Health Sciences, Chulalongkorn University , Bangkok , Thailand

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ABSTRAK (ENGLISH)

Objective

To address the effects of storage duration on red blood cell (RBC)–derived microparticles (RMPs) in packed RBCs from donors who have thalassemia.

Materials and Methods

Packed RBCs were prepared according to laboratory routine. The quantity of RMPs was determined using FACSCalibur and counting beads.

Results

Across durations of storage, the packed RBCs from donors with thalassemia (n = 28) and healthy volunteers (n = 104) showed average RMPs to be 47,426 (10,139–127,785) particles/ μ L vs 49,021 (13,033–126,749) particles/ μ L, respectively ($P = .63$). The peak RMP levels in donors with thalassemia and healthy volunteers, respectively, were shown in products from storage days 34 and 38. Both groups showed a trend toward a positive association between RMP concentration and the duration of storage in packed RBC bags stored under blood bank conditions.

Conclusion

Our results suggest that storage-induced RMP release has similar effects in stored packed RBCs obtained from both donors with thalassemia and healthy volunteers.

Dokumen 12 dari 23

Is Cryoprecipitate-Reduced Plasma an Efficacious Replacement Fluid for Therapeutic Plasma Exchange for Patients with Thrombotic Microangiopathy? A Single-Center Retrospective Experience

Kim, Han Joo ¹ ; Yang, John Jeongseok ¹ ; Kim, Hyungsuk ² ; Hwang, Sang-Hyun ¹ ; Heung-Bum Oh ¹ ; Chung, Yousun ³ ; Dae-Hyun Ko ¹ ¹ Department of Laboratory Medicine, Asan Medical Center, University of Ulsan College of Medicine , Seoul , Republic of Korea ² Department of Laboratory Medicine, Seoul National University Hospital , Seoul , Republic of Korea ³ Department of Laboratory Medicine, Kangdong Sacred Heart Hospital , Seoul , Republic of Korea

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ABSTRAK (ENGLISH)

Objective

We designed a study to compare the efficacy of cryoprecipitate-reduced plasma (CRP) and fresh frozen plasma (FFP), at the level of individual sessions, for treating refractory thrombotic microangiopathy (TMA) with therapeutic plasma exchange (TPE).

Materials and Methods

Platelet counts ($\times 10^3/\mu$ L) and lactate dehydrogenase (LD; IU/L) levels were measured before and after each session. We compared the mean-percentage and absolute changes in platelet count and LD after each TPE session.

Results

The data from 33 patients treated for TMA between 2009 and 2018 were collected for this study. Both absolute and percentage increases in the platelet count were statistically significant ($P = .003$ and $P = .011$, respectively) when CRP was used. However, when patients were divided into subgroups according to specific diagnosis, no significant differences were found among the groups, except in terms of the absolute platelet count increase in the thrombotic thrombocytopenic purpura group ($P < .001$).

Conclusion

The platelet count increase was higher when patients received CRP than when they received FFP. We found that CRP may be a rescue option for patients with refractory TMA.

Dokumen 13 dari 23

A Simplified Protocol for Microsatellite Instability Evaluation in Iranian Patients at Risk for Lynch Syndrome

Abdollahi, Zeinab ¹ ; Mohammad Amin Tabatabaiefar ¹ ; Noruzi, Mahnaz ² ; Miar, Paniz ¹ ; Kazemi, Mohammad ¹ ; Naimi, Azar ³ ; Emami, Mohammad Hasan ⁴ ; Zeinalian, Mehrdad ^{1 1} Department of Genetics and Molecular Biology, School of Medicine, Isfahan University of Medical Sciences , Isfahan , Iran ² Department of Biology, Faculty of Sciences, Shahid Chamran University , Ahvaz , Iran ³ Department of Pathology, School of Medicine, Isfahan University of Medical Sciences , Isfahan , Iran ⁴ Poursina Hakim Digestive Diseases Research Center , Isfahan , Iran

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ABSTRAK (ENGLISH)

Objective

The most important tumor characteristic of Lynch syndrome (LS) is microsatellite instability (MSI). In the current study, BAT34c4 and BAT26 mononucleotide markers were evaluated as part of efforts to test a cost-effective panel for MSI testing in Iranian patients, comparing it with the Promega kit.

Methods

Amsterdam II clinical criteria were used to identify patients at risk for LS. The MSI status of these patients was determined using BAT34c4 and BAT26 markers, as well as the Promega kit. The results of both methods were compared, and the sensitivity and specificity of new short tandem repeat (STR) markers were estimated using statistical formulas.

Results

Of the 37 patients we studied who were at risk for LS, 27% showed MSI-high results, via the Promega kit. The same results were achieved for BAT34c4 and BAT26 separately.

Conclusions

The novel 2-marker kit for MSI testing has similar accuracy as the Promega kit at a lower cost, due to fewer markers and a more economical labeling method.

Dokumen 14 dari 23

Quantitative Detection of Anti-SARS-CoV-2 Antibodies Using Indirect ELISA

Luo, Shuhong¹; Xu, Jianhua²; Chih Yun Cho³; Zhu, Siwei¹; Whittaker, Kelly C³; Wang, Xingqi³; Feng, Jie³; Wang, Meng³; Xie, Shehuo¹; Fang, Jianmin¹; Huang, Andy S³; Song, Xuedong¹; Ruo-Pan, Huang¹¹ RayBiotech, Guangzhou, China² Department of Laboratory Science, Shunde Hospital of Guangzhou University of Chinese Medicine, Guangzhou, China³ RayBiotech Life, Peachtree Corners, Georgia, US

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ABSTRAK (ENGLISH)

Objective

Real-time reverse transcription-polymerase chain reaction is the gold standard for the diagnosis of COVID-19, but it is necessary to utilize other tests to determine the burden of the disease and the spread of the outbreak such as IgG-, IgM-, and IgA-based antibody detection using enzyme-linked immunosorbent assay (ELISA).

Materials and Methods

We developed an indirect ELISA assay to quantitatively measure the amount of COVID-19 IgG, IgM, and IgA antibodies present in patient serum, dried blood, and plasma.

Results

The population cutoff values for positivity were determined by receiver operating characteristic curves to be 1.23 U/mL, 23.09 U/mL, and 6.36 U/mL for IgG, IgM, and IgA, respectively. After albumin subtraction, the specificity remained >98% and the sensitivity was 95.72%, 83.47%, and 82.60%, respectively, for IgG, IgM, and IgA antibodies to the combined spike subunit 1 receptor binding domain and N proteins in serum. Plasma and dried blood spot specimens were also validated on this assay.

Conclusion

This assay may be used for determining the seroprevalence of SARS-CoV-2 in a population exposed to the virus or in vaccinated individuals.

Dokumen 15 dari 23

Semaphorin 3A Levels in Lupus with and without Secondary Antiphospholipid Antibody Syndrome and Renal Involvement

Gözde Sevgi Kart Bayram ¹ ; Erden, Abdulsamet ² ; Doğan Bayram ¹ ; Özdemir, Bahar ² ; Karakaş, Özlem ² ; Apaydın, Hakan ² ; Ortaç Ateş ³ ; Serdar Can Güven ² ; Berkan Armağan ² ; Gök, Kevser ² ; Yüksel Maraş ² ; Omma, Ahmet ⁴ ; Küçükşahin, Orhan ⁵ ; Topçuoğlu, Canan ⁶ ; Erten, Şükran ⁵ ¹ Ankara City Hospital, Internal Medicine , Üniversiteler Mahallesi, Ankara , Turkey ² Ankara City Hospital, Rheumatology , Ankara , Turkey ³ Ankara City Hospital, Biochemistry , Ankara , Turkey ⁴ TC Sağlık Bakanlığı Ankara Numune Eğitim ve Araştırma Hastanesi , Ankara , Turkey ⁵ Ankara Yıldırım Beyazıt University, Rheumatology , Ankara , Turkey ⁶ Ankara Numune Education and Research Hospital, Biochemistry Department , Ankara , Turkey

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ABSTRAK (ENGLISH)

Objective

The aim of this study is to evaluate semaphorin 3A levels in patients with systemic lupus erythematosus (SLE) with and without renal involvement and secondary antiphospholipid antibody syndrome (APS).

Methods

Patients with SLE were grouped according to the presence of secondary APS or renal involvement. The control group consisted of age-matched, nonsmoking, healthy volunteers. Semaphorin 3A levels were compared among groups. All patients with SLE were regrouped according to the presence of thrombotic events, miscarriages, and proteinuria, and semaphorin 3A levels were investigated. Finally, semaphorin 3A levels of all patients with SLE as a single group were compared to those of the control patients.

Results

The mean semaphorin 3A values were 16.16 ± 2.84 ng/mL in the control group, 9.05 ± 5.65 ng/mL in patients with SLE without nephritis and APS, 11.28 ± 5.23 ng/mL in the SLE with APS group, and 8.53 ± 5.11 ng/mL in the lupus nephritis group. When all 3 patient groups were examined as a single group, the mean semaphorin 3A value was significantly lower than that of the control group. Semaphorin 3A was reduced in patients with SLE with thromboembolism and/or history of miscarriage.

Conclusion

Semaphorin 3A levels were lower in all patient groups compared to the control group. Moreover, the reduced semaphorin 3A levels in patients with a history of thromboembolism and/or miscarriage suggest that semaphorin 3A may play an important role in the pathogenesis of vasculopathy.

Acute Promyelocytic Leukemia with a BCR-ABL1 Rearrangement in a Minor Clone

Cho, Yonggeun ¹ ; Hyun, Jungwon ² ; Kim, Miyoung ³ ; Han, Boram ⁴ ; Young Kyung Lee ¹ ¹

Department of Laboratory Medicine, Hallym University Sacred Heart Hospital, Hallym University College of Medicine , Anyang , Republic of Korea ² Department of Laboratory Medicine, Dongtan Sacred Heart Hospital, Hallym University College of Medicine , Hwaseong , Republic of Korea ³ Department of Laboratory Medicine, Asan Medical Center, University of Ulsan College of Medicine , Seoul , Republic of Korea ⁴ Department of Internal Medicine, Hallym University Sacred Heart Hospital, Hallym University College of Medicine , Anyang, Republic of Korea

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ABSTRAK (ENGLISH)

Acute promyelocytic leukemia (APL) is a type of acute myeloid leukemia characterized by predominating abnormal promyelocytes with a *PML-RARA* rearrangement or a variant thereof. *BCR-ABL1* rearrangement is an oncogenic event that is usually associated with chronic myeloid leukemia but also occurs in both acute lymphoblastic and acute myeloid leukemias and in healthy individuals. However, APL with concurrent *PML-RARA* and *BCR-ABL1* rearrangements has rarely been reported. Herein, we describe a patient with APL exhibiting a *BCR-ABL1* rearrangement in a minor clone and discuss the importance of evaluating this genetic alteration in terms of pathogenesis and treatment.

A Scoping Review of Medical Laboratory Science and Simulation: Promoting a Path Forward with Best Practices

Webb, Tera L ¹ ; McGahee, Jarkeshia ² ; Brown, Michelle R ² ¹ Department of Clinical and Diagnostic Sciences, School of Health Professions, University of Alabama at Birmingham , Birmingham, Alabama , USA ² Department of Health Services Administration, School of Health Professions, University of Alabama at Birmingham , Birmingham, Alabama , USA

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ABSTRAK (ENGLISH)

Objective

In medical laboratory science, there is a need to enhance the clinical learning curriculum beyond laboratory skill and diagnostic interpretation competency. Incorporating simulation presents an opportunity to train and produce medical

laboratory scientists with the skills to communicate and work effectively in an interprofessional healthcare team.

Methods

A scoping review was performed to (i) understand the landscape of research literature on medical laboratory science and simulation and (ii) provide a path for future research directions. The International Nursing Association for Clinical Simulation and Learning Standards of Best Practice: Simulation were used as a guiding framework for literature that described simulation activities.

Results

Out of 439 articles from multiple databases, 32 were eligible for inclusion into this review. Of the 14 articles that described a simulation activity, only 3 described or partially described each component of the best practice criteria for simulation. Articles that did not describe the design and implementation of simulation (n = 18) consisted of 7 opinion-based papers, 4 narrative reviews, 5 case reports, and 2 empirical papers.

Conclusion

Despite increases in medical laboratory science with simulation, there is a need for more detailed empirical studies, more studies with an interprofessional context, and more methodological rigor.

Dokumen 18 dari 23

Adequate Antibody Response to COVID-19 Vaccine in Patients with Monoclonal Gammopathies and Light Chain Amyloidosis

Wu, Alan H B ¹ ; Wang, Chia-Ching ² ; Ong, Chui Mei ¹ ; Lynch, Kara L ¹ ¹ Department of Laboratory Medicine, University of California , San Francisco, California , US ² Department of Medicine, Division of Hematology/Oncology, University of California , San Francisco, California , US

[Link dokumen ProQuest](#)

ABSTRAK (ENGLISH)

Objective

Determine the COVID-19 seroconversion rate for patients with multiple myeloma receiving a COVID-19 vaccine.

Materials and Methods

After 45 patients received their second COVID-19 vaccine dose, their serum IgG antibodies were measured: 22 with monoclonal gammopathy (MG) of unknown significance, 3 with smoldering myeloma, 2 with light chain amyloidosis, and 18 with MG (9 in remission, 6 out of remission, and 3 with free light-chain gammopathy alone). A second serum specimen was retained for 16 patients with MG. Their antibody levels were compared to those of 78 uninfected healthy vaccinated control patients.

Results

Three patients with MG had low antibody levels on blood collected 98, 100, and 113 days after the initial vaccine dose (2 with MG of unknown significance and 1 with hypogammaglobulemia). The other 40 patients with MG (seroconversion rate 93%) and both patients with amyloidosis produced antibodies. Relative to days after vaccination, patients with MG had lower antibody levels than control patients.

Conclusion

After receiving a COVID-19 vaccine, most patients with MG produce anti-SARS-CoV-2 antibodies comparable to levels in uninfected vaccinated healthy control patients.

Dokumen 19 dari 23

Protocols to Dissolve Amorphous Urate Crystals in Urine

Kristina Jackson Behan ¹ ; Johnston, Michael A ² ¹ Medical Laboratory Sciences Department, University of West Florida , Pensacola, Florida , USA ² Pensacola State College , Pensacola, Florida

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ABSTRAK (ENGLISH)

Objective

Amorphous urate crystals can obscure significant findings during a routine urinalysis. There is no standardized protocol to minimize their effect.

Materials and Methods

We tested 210 urine specimens. Three specimens had high red blood cell (RBC) or white blood cell (WBC) counts. Fifty-six specimens formed amorphous urates. Sediment from these specimens was treated with 50 mM sodium hydroxide (NaOH) at a 1:2 and/or 1:4 dilution. We warmed 22 specimens with crystals at various temperatures.

Results

Amorphous urate crystals formed in concentrated urine with an acidic pH. Adding 50 mM NaOH dissolved amorphous urates, revealing the presence of underlying bacteria and yeast, but WBC and RBC counts were grossly decreased. Prewarming unspun specimens to 60°C for 90 seconds dissolved most amorphous urates.

Conclusion

The protocol to eliminate amorphous urate crystals is to prewarm the specimen before testing. Adding 50 mM NaOH to sediment dissolves amorphous urates to enhance the visibility of bacteria and yeast but has a deleterious effect on WBC and RBC.

Influence of Tacrolimus on Serum Vitamin A Levels in Patients after Renal Transplantation

Yang, Shulin ¹ ; Le, Juan ¹ ; Peng, Rui ¹ ; Wang, Shaoting ¹ ; Li, Yan ¹ ¹ Department of Clinical Laboratory, Renmin Hospital of Wuhan University , Wuhan , China

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ABSTRAK (ENGLISH)

Objective

Patients after renal transplantation exhibit high levels of vitamin A, which has been previously suspected to be related with immunosuppressive medication. However, this possibility has not yet been systematically studied.

Materials and Methods

Altogether, 116 patients were included and divided into 2 groups based on serum creatinine levels. The mean values of vitamin A levels between the 2 groups were compared using the Student's *t*-test. The Pearson's correlation coefficient was calculated to assess the association between vitamin A and tacrolimus.

Results

Elevated vitamin A levels were found in both groups, and patients with kidney dysfunction after transplantation showed higher levels of vitamin A than patients with recovered kidney function. Most important, we could not identify any significant correlations between vitamin A level and tacrolimus for both groups. After long-term and short-term monitoring for different patients, obvious individual differences emerged. Such results generally ruled out previous suspicions regarding causality between immunosuppressive medication (tacrolimus) and vitamin A elevation after renal transplantation.

Conclusion

Patients after renal transplantation showed higher serum vitamin A levels than people with a normal medical exam, even if their graft function was restored. The cause of this abnormality did not seem to be related with tacrolimus.

A UFLC-MS/MS Method for the Simultaneous Analysis of Urinary Podocin and Podocalyxin in Patients with Nephrotic Syndrome

Erdem, Bilge Karatoy ¹ ; Özcan, Mualla ² ; Vural, Taner Yılmaz ³ ; Akkaya, Bahar ² ; Çetinkaya, Ramazan ³ ; Ersoy, Fevzi ³ ; Gültekin Süleymanlar ³ ; Akbas, Halide ¹ ¹ Akdeniz University Faculty of Medicine Department of Clinical Biochemistry , Antalya , Turkey ² Akdeniz University Faculty of Medicine

[Link dokumen ProQuest](#)

ABSTRAK (ENGLISH)

Objective

To create an efficient and robust mass spectrometric method for the simultaneous quantitation of podocin and podocalyxin in urine samples and to evaluate urinary podocin and podocalyxin levels in patients with nephrotic syndrome (NS).

Methods

A mass spectrometric method was generated for the measurement of tryptic peptides in urine sediment. Separation of peptides was achieved via liquid chromatography, and mass spectrometric analyses were conducted by electrospray ionization triple-quadrupole mass spectrometry in the multiple reaction monitoring mode.

Results

Intra- and interassay precision values were below 12% and accuracies ranged from 87% to 111% for both of peptides. The validated method was successfully applied to detect these peptides in patients with NS. Urine podocin and podocalyxin levels were significantly higher in patients with NS compared to healthy controls.

Conclusions

This proposed mass spectrometric method provides technological evidence that will benefit the clinical field in the early diagnosis and follow-up of NS.

Dokumen 22 dari 23

Relationships Between Circulating Tenascin-C Levels and Gonadal Hormones in Male Patients with Depressive Disorder: A Retrospective, Cross-Sectional Study

Peng, Rui ¹ ; Li, Di ¹ ; Li, Yan ¹ ¹ Department of Clinical Laboratory, Renmin Hospital of Wuhan University , Wuhan, Hubei Province , P.R. China

[Link dokumen ProQuest](#)

ABSTRAK (ENGLISH)

Objective

Tenascin-C (TNC) is an extracellular matrix glycoprotein closely associated with the progression of psychiatric disorders. The present study was performed to investigate the possible association between serum gonadal hormones and TNC levels in male patients with depressive disorder.

Materials and Methods

We measured serum TNC levels by enzyme-linked immunosorbent assay. In addition, we investigated the influence of testosterone (T) and estradiol (E_2) on TNC levels in primary neuronal cultures.

Results

Patients with depression had lower levels of T, free tri-iodothyronine (FT3), thyroid-stimulating hormone (TSH), and the T/E_2 ratio than healthy control patients. Levels of TNC and high-sensitivity C-reactive protein were significantly higher in patients than in healthy volunteers. Serum TNC concentrations were negatively associated with levels of E_2 and T and with the T/E_2 ratio. Levels of TNC, TSH, and FT3 and the T/E_2 ratio were predictors of depression. Among men with depression, TNC was negatively associated with T levels and with the T/E_2 ratio. Incubating pheochromocytoma 12 cells with the combination of T and E_2 greatly decreased TNC levels in the culture medium.

Conclusion

Increased TNC levels may predict imbalance between T and E_2 in patients with depression, and gonadal hormones may modulate TNC expression in vivo.

Dokumen 23 dari 23

Novel Methods for Detecting Human Cholesterol Crystals from Sampled Blood

Iwa, Nobuzo¹; Yutani, Chikao¹; Komatsu, Sei²

; Takahashi, Satoru²; Takewa, Mitsuhiko²; Ohara, Tomoki²; Kodama, Kazuhisa²¹ Division of Pathology, Cardiovascular Center, Osaka Gyoumeikan Hospital, Osaka, Japan² Department of Cardiology, Cardiovascular Center, Osaka Gyoumeikan Hospital, Osaka, Japan

[Link dokumen ProQuest](#)

ABSTRAK (ENGLISH)

Objective

Nonobstructive general angiography (NOGA) is a novel modality to detect and sample spontaneous ruptured aortic plaques (SRAPs). We aimed to establish novel methods to detect cholesterol crystals (CCs) in sampled SRAPs.

Methods

Blood specimens containing SRAPs were obtained from patients using NOGA. Blood was instantly frozen on a glass

slide and subsequently thawed for quantitative analysis and spread onto a filter paper that was rinsed using distilled water. Qualitative analysis was performed for the rinsed water using polarized light microscopy, and the filter paper was embedded in paraffin for histologic analysis.

Results

The CCs were clearly observed after hemolysis using the instant freeze-thaw method. The filter paper rinse method indicated free CCs of varying shapes under polarized light microscopy without erythrocytes. On the filter paper, sampled SRAPs showed Lamé-like small particles. Histopathology revealed various atheromatous components.

Conclusion

A set of novel methods for detecting CCs from sampled blood was established.

Daftar Pustaka

Citation style: APA 6th - Annotated with Abstracts - American Psychological Association, 6th Edition

Shalaby, A., Laharwani, H., Bates, J. T., & Kyle, P. B. (2022). Efficacy of POC antibody assays after COVID-19 infection and potential utility for "Immunity passports". *Labmedicine*, 53(3), 262-265. doi:<https://doi.org/10.1093/labmed/lmab093>

Objective Numerous manufacturers market lateral flow assays for the detection of SARS-CoV-2 antibodies, but there are many questions about the reliability and efficacy of these tests. **Materials and Methods** Serum specimens from 60 individuals were analyzed using 2 lateral flow antibody assays, an in-house enzyme-linked immunosorbent assay (ELISA), and the Abbott SARS-CoV-2 IgG chemiluminescent immunoassay. **Results** The BioMedomics and Premier Biotech lateral flow assays were positive for IgM in 73.3% and 70% and for IgG in 80% and 73.3% of specimens, respectively. The ELISA assay was positive for IgM and IgG in 73.3% and 86.7% of specimens from infected individuals, whereas the Abbott assay was positive in 80%. The specificities of the 4 assays ranged from 96.7% to 100% for IgM and from 93.3% to 100% for IgG. **Conclusion** Results of the 2 lateral flow assays were comparable to those of the ELISA and Abbott assays. Assay efficacy depended on length of time after SARS-CoV-2 infection.

Kaur, P., Chaudhry, C., Panigrahi, I., Srivastava, P., & Kaur, A. (2022). Gas chromatography mass spectrometry aided diagnosis of glutathione synthetase deficiency. *Labmedicine*, 53(3), e59-e61. doi:<https://doi.org/10.1093/labmed/lmab084>

Glutathione synthetase (GSS) deficiency is a rare disorder, occurring with a frequency of less than 1 in 100,000 individuals worldwide. The clinical presentation may vary from mild to severe, and manifestations include hemolytic anemia, hyperbilirubinemia, metabolic acidosis, neurological problems, and sepsis. Herein, we present a case of a newborn boy with the most severe phenotype of GSS deficiency, diagnosed based on clinical features and increased urinary 5-oxoproline levels determined via gas chromatography mass spectrometry (GCMS) testing.

Jasinge, E., Fernando, M., Indika, N. R., Trunzo, R., Schröder, S., Vidanapathirana, D. M., . . . Ratnayake, P. (2022). Urine organic acid analysis: Key diagnostic test for fumaric aciduria in a sri lankan child. *Labmedicine*, 53(3), e48-e50. doi:<https://doi.org/10.1093/labmed/lmab083>

Fumaric aciduria resulting from fumarate hydratase deficiency is a rare inherited disorder of the Krebs tricarboxylic acid cycle that is characterized by neurologic manifestations, a spectrum of brain abnormalities, and the excretion of fumaric acid in urine. We describe a 3 year old Sri Lankan boy who was referred at age 10 months with poor weight gain and hypotonia for further laboratory investigations. In addition to global developmental delay, there were noticeable dysmorphic features with a prominent forehead, low-set ears, micrognathia, and hypertelorism with persistent neutropenia. Urine organic acid assay revealed a massive elevation of fumaric acid on 2 occasions. Molecular analysis revealed a homozygous likely pathogenic missense variant, NM000143.3:c.1048C>T p. (Arg350Trp), in the FH gene, confirming the biochemical diagnosis. Our patient was the first patient in Sri Lanka molecularly diagnosed with fumaric aciduria. This case study highlights the importance of performing organic acid assays in children presenting with neurologic manifestations especially when these are suspected to have a metabolic basis.

Coker, C., & Uysal, S. (2022). Validation of an in-house-developed GC-MS method for 5 α -cholestanol according to ISO 15189:2012 requirements. *Labmedicine*, 53(3), 278-284. doi:<https://doi.org/10.1093/labmed/lmab095>

Objective The aim of this study was to validate a gas chromatography-mass spectrometry (GC-MS) method for the measurement of 5 α -cholestanol in the clinical laboratory in agreement with ISO 15189:2012. **Materials and Methods** The GC-MS performance was evaluated and proficiency testing data were used to estimate the measurement uncertainty of the method considering the recommendations of international guidelines. **Results** The calibration curves were linear from 6 to 50 $\mu\text{mol/L}$, with $r^2 > .99$. The limit of detection and limit of quantitation were determined to be 0.36 and 2.58 $\mu\text{mol/L}$, respectively. The bias ranged from -18.9% to 15.2% for 6.5, 18.3, and 66 $\mu\text{mol/L}$. The

intra- and interassay reproducibility was <20% at the various concentrations studied. The expanded uncertainty was determined to be 50.9%. Conclusion The GC-MS method for the measurement of 5 α -cholestanol has proved to have acceptable analytical performance for use in the clinical laboratory.

Kyoung-Jin, P., & Jong-Ho, P. (2022). Variations in nomenclature of clinical variants between annotation tools. *Labmedicine*, 53(3), 242-245. doi:<https://doi.org/10.1093/labmed/lmab074>

Background Accurate nomenclature of variants is an essential element for genetic diagnosis and patient care. **Objective** To investigate annotation differences of clinical variants between annotation tools. **Methods** We analyzed 218,156 clinical variants from the Human Gene Mutation Database. Multiple nomenclatures based on RefSeq transcripts were provided using ANNOVAR and snpEff. **Results** The concordance rate between ANNOVAR and snpEff was approximately 85%. Based on the Human Genome Variation Society (HGVS) nomenclature, snpEff was more accurate than ANNOVAR (coding variants, 99.3% vs 84.9%; protein variants, 94.3% vs 79.8%). When annotating each variant with ANNOVAR and snpEff, the accuracy of nomenclature was 99.5%. **Conclusions** There were substantial differences between ANNOVAR and snpEff annotations. The findings of this study suggest that simultaneous use of multiple annotation tools could decrease nomenclature errors and contribute to providing standardized clinical reporting.

Wu, Y., Cao, L., & Qi, J. (2022). Elevated serum HE4 concentrations and risk of cardiac complications among hospitalized patients with burns. *Labmedicine*, 53(3), 320. doi:<https://doi.org/10.1093/labmed/lmab110>

Background The decrease in effective blood volume after burns is closely related to abnormal heart function. **Objective** To investigate whether serum human epididymis protein 4 (HE4), an indicator of early renal injury, contributes to increased risk of cardiac complications in patients with burns. **Methods** Within 24 hours after hospital admission, clinical condition assessment and biochemical testing in patients with burns were performed. Multivariate analysis was performed by evaluating the relationship between serum HE4 levels and risk of cardiac complications (cardiac insufficiency, arrhythmia, and myocardial infarction) during hospitalization. **Results** The number (percentage) of cardiac complications in all included patients with burns was 80 (15.6%). The results of sensitivity analysis suggest that elevated serum HE4 levels were related to higher risk of cardiac complications in patients with sepsis (OR = 2.1; 95% CI, 1.19–3.17; P <.001) and in patients without sepsis (OR = 2.29; 95% CI, 1.33–4.71; P = .005), respectively, after adjustments for clinical confounding factors were made. Sepsis did not have a modification effect on the association between serum and cardiac complications among these patients. Also, the results of ROC curve analysis showed that serum HE4 levels have good predictive value for predicting cardiac complications in patients with burns (AUC = 0.708; 95% CI, 0.61–0.81; P <.001). **Conclusions** In the current study, we identified that elevated HE4 levels contributed to increased risk of cardiac complications in the hospital in patients with burns. This novel finding suggests that burn patients with serum HE4 may provide the opportunity to predict cardiac complications before hospital admission.

Tantanate, C., Talabthong, S., & Lamyai, P. (2022). Kanamycin supplement for the disaggregation of platelet clumps in EDTA-dependent pseudothrombocytopenia specimens. *Labmedicine*, 53(3), e69-e73. doi:<https://doi.org/10.1093/labmed/lmab090>

Objective To indicate the ability to disaggregate platelet clumps by vortex mixing and kanamycin supplementation in EDTA-dependent pseudothrombocytopenia (EDTA-PTCP) specimens. **Materials and Methods** For patients with EDTA-PTCP, citrate-anticoagulated, primary EDTA-anticoagulated, vortex-mixed, and kanamycin-treated specimens were tested for complete blood count and platelet-related parameters. **Results** Forty-eight specimens were included. Nineteen (39.6%) of the vortex-mixed specimens and 42 (87.5%) of the kanamycin-treated specimens revealed platelet counts more than those of the primary EDTA specimens, with levels exceeding 100 \times 10⁹/L. The platelet count and platelet recovery of the kanamycin-treated specimens were higher than those of the vortex-mixed specimens. **Conclusion** Kanamycin supplementation to EDTA-PTCP blood may be considered as an alternative approach when the recollection of specimens is impractical. Only platelet-related parameters from kanamycin treatment were suitable for guiding patient management. Further studies about the impact of these methods in

patients with various conditions, such as in patients with advanced kidney disease, should be conducted.

Jasinge, E., Fernando, M., Neluwa-Liyanage, R. I., Trunzo, R., Schröder, S., Vidanapathirana, D. M., . . . Ratnayake, P. (2022). Corrigendum to: Urine organic acid analysis: Key diagnostic test for fumaric aciduria in a sri lankan child. *Labmedicine*, 53(3) doi:<https://doi.org/10.1093/labmed/lmab107>

Cetin, Z., Kosem, A., Catak, M., Can, B., Baser, O., & Guler, S. (2022). The relationship of thyroid functions with ADMA, IMA, and metabolic laboratory parameters in euthyroid adults with and without autoimmune thyroiditis. *Labmedicine*, 53(3), 290. doi:<https://doi.org/10.1093/labmed/lmab098>

Objective To investigate the relationship between thyroid functions and asymmetric dimethylarginine (ADMA), ischemia-modified albumin (IMA), and other metabolic laboratory markers in euthyroid adults and whether narrower thyroidal targets are required for lower metabolic risk. **Materials and Methods** Thyroid functions, antithyroid autoantibodies, and metabolic parameters were measured for 115 patients. Forty-seven had autoimmune thyroiditis (AIT). Analyses were performed according to cutoff values of 1, 2, 2.5, and 3 mIU/L for thyrotropin, 0.84 ng/dL for free thyroxine (fT4), and 3.59 ng/dL for free tri-iodothyronine (fT3). **Results** There was no relationship between thyrotropin and fT3 cutoff values and metabolic parameters. Only C-reactive protein was lower in the group with thyrotropin ≤ 2.5 μ IU/L. A weak positive correlation was found between fT4 with IMA and IMA corrected for albumin ($r = 0.187$, $P = .05$; $r = 0.204$, $P = .034$, respectively). There was no difference between AIT and the metabolic laboratory parameters examined in the study. **Conclusion** This study is the first to evaluate ADMA in AIT. Narrower thyroid function targets are not required for better metabolic control in euthyroid adults.

Wang, C., Liu, H., & Feng, X. (2022). The impact of sodium dodecyl sulfate and 2-mercaptoethanol on antibody and antigen binding. *Labmedicine*, 53(3), 307-313. doi:<https://doi.org/10.1093/labmed/lmab081>

Objective To evaluate the effect of sodium dodecyl sulfate (SDS) and 2-mercaptoethanol (2-ME) on antigen-antibody binding when incubated at 100°C, which is the pretreatment temperature required for western blots. **Methods** Serum that tested positive for hepatitis B surface antigen (HBsAg) plus loading buffer were mixed at a ratio of 4:1 and incubated in a water bath. We then detected HBsAg using double immunodiffusion and ELISA. **Results** The HBsAg titer was 1:512 in the control group when incubated at 37°C. Incubation with SDS at 100°C reduced the antigen titer to 1:32. The inhibitory effect on HBsAg titer reached 96.9% after incubation at 100°C with SDS and 2-ME. **Conclusion** We detected strong inhibition of antigens in western blots via SDS and 2-ME. It is likely that false-negative results will be obtained from western blots of antigens with weak resistance to these reagents.

Noulsri, E., Lerdwana, S., Palasuwan, D., & Palasuwan, A. (2022). Storage duration and red blood Cell-Derived microparticles in packed red blood cells obtained from donors with thalassemia. *Labmedicine*, 53(3), 302-306. doi:<https://doi.org/10.1093/labmed/lmab106>

Objective To address the effects of storage duration on red blood cell (RBC)-derived microparticles (RMPs) in packed RBCs from donors who have thalassemia. **Materials and Methods** Packed RBCs were prepared according to laboratory routine. The quantity of RMPs was determined using FACSCalibur and counting beads. **Results** Across durations of storage, the packed RBCs from donors with thalassemia ($n = 28$) and healthy volunteers ($n = 104$) showed average RMPs to be 47,426 (10,139–127,785) particles/ μ L vs 49,021 (13,033–126,749) particles/ μ L, respectively ($P = .63$). The peak RMP levels in donors with thalassemia and healthy volunteers, respectively, were shown in products from storage days 34 and 38. Both groups showed a trend toward a positive association between RMP concentration and the duration of storage in packed RBC bags stored under blood bank conditions. **Conclusion** Our results suggest that storage-induced RMP release has similar effects in stored packed RBCs obtained from both donors with thalassemia and healthy volunteers.

Kim, H. J., Yang, J. J., Kim, H., Hwang, S., Heung-Bum Oh, Chung, Y., & Dae-Hyun Ko. (2022). Is cryoprecipitate-reduced plasma an efficacious replacement fluid for therapeutic plasma exchange for patients with thrombotic microangiopathy? A single-center retrospective experience. *Labmedicine*, 53(3), 266-272. doi:<https://doi.org/10.1093/labmed/lmab092>

Objective We designed a study to compare the efficacy of cryoprecipitate-reduced plasma (CRP) and fresh frozen plasma (FFP), at the level of individual sessions, for treating refractory thrombotic microangiopathy (TMA) with therapeutic plasma exchange (TPE). **Materials and Methods** Platelet counts ($\times 10^9/\mu\text{L}$) and lactate dehydrogenase (LD; IU/L) levels were measured before and after each session. We compared the mean-percentage and absolute changes in platelet count and LD after each TPE session. **Results** The data from 33 patients treated for TMA between 2009 and 2018 were collected for this study. Both absolute and percentage increases in the platelet count were statistically significant ($P = .003$ and $P = .011$, respectively) when CRP was used. However, when patients were divided into subgroups according to specific diagnosis, no significant differences were found among the groups, except in terms of the absolute platelet count increase in the thrombotic thrombocytopenic purpura group ($P < .001$). **Conclusion** The platelet count increase was higher when patients received CRP than when they received FFP. We found that CRP may be a rescue option for patients with refractory TMA.

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