www.TurkJBiochem.com

# TÜRK BİYOKİMYA DERGİSİ

# Turkish Journal of Biochemistry

## TBD ULUSLARARASI BİYOKİMYA KONGRESİ 2022
## 33. ULUSAL BİYOKİMYA KONGRESİ
26-30 Ekim 2022, İzmir, Türkiye

## TBS INTERNATIONAL BIOCHEMISTRY CONGRESS 2022
## 33RD NATIONAL BIOCHEMISTRY CONGRESS
26-30 October 2022, İzmir, Türkiye

Türk Biyokimya Derneği'nin yayın organıdır.
*[Published by the Turkish Biochemical Society]*

2022

Cilt [Volume] 47

Ek Sayı [Supplement] 2

YER ALDIĞI İNDEKSLER [INDEXED BY]

SCI Expanded, Journal Citation Reports/Science Edition, Chemical Abstracts, Index Copernicus, Embase, Scopus, Ulakbim Türk Tıp Dizini, Ulrich's Periodical Directory, EBSCO, Türkiye Atıf Dizini

# POSTER PRESENTATION ABSTRACTS

## P001
## CALCULATION OF IMPRESSION AND REFERENCE CHANGE VALUES OF TESTS RUN ON ROCHE COBAS 8000 ANALYZER

Büşra Üresin Yazlak, Hilmi Furkan Arslan, Zahide Adiyaman, Bağnu Orhan, Mevlüde Ayyildiz Yenigün
Health Sciences University, İstanbul Teaching and Research Hospital, Medical Biochemistry Dept., İstanbul, Türkiye

OBJECTIVES: We aimed to calculate analytical variation and reference change value for biochemistry analytes studied on the Roche Cobas 8000 analyzer that we routinely use in our laboratory.
MATERIALS and METHODS: The reference change value for our analytes;calculated with formula $2^{1/2}$ x Z x $(CV_A^2 + CV_I^2)^{1/2}$. ( 95% probability, two-way; Z=2.58 taken) Three-month, two-level internal quality control results were used to calculate analytical coefficient of variation ($CV_A$). Median values from meta-analysis studies in EFLM biological variation database were used for intra-individual ($CV_I$) and inter-individual ($CV_G$) coefficients of variation. The formulas CVA < 0.25 x CVI for optimum performance, CVA < 0.50 x CVI for acceptable performance and CVA < 0.75 x CVI for minimum performance were used to determine quality specifications developed for precision.
RESULTS: When evaluated accordingly, the reference change values (%) for our analytes are in order; glucose 16, urea 39, creatinine 19, total cholesterol 15, triglyceride 55, HDL-cholesterol 19, LDL-cholesterol 24, AST 27, ALT 29, sodium 5, potassium 13, chlorine 8, calcium 7, magnesium 10, phosphorus 23, iron 57 calculated. Optimum for urea, triglyceride, AST and iron from our analytes; acceptable for total cholesterol, LDL-cholesterol, ALT and phosphorus; it meets the minimum performance quality specifications for glucose, HDL cholesterol and potassium; creatinine, sodium, chlorine, calcium and magnesium do not seem to provide.
CONCLUSIONS: Analytical and biological sources of variation should be considered for reliability of laboratory results. Tests that do not meet quality specifications require root cause analysis followed by corrective and preventive action.
Keywords: analytical performance, precision, reference change value

## P002
## WHICH ANALYTICAL PERFORMANCE MODEL TO CHOOSE FOR Hb A1C: BIOLOGICAL VARIATION, MEASUREMENT UNCERTAINTY, TOTAL ERROR OR SIGMA-METRICS?

Rabia Tan
Aydın Public Health Laboratory, Clinical Biochemistry Dept.

OBJECTIVES: HbA1c test is one of the most important biomarkers in the diagnosis, follow-up and treatment of diabetes. HbA1c analytical performance should be closely monitored as it may alter the treatment algorithm.
MATERIALS and METHODS: Using Bio-Rad Variant II Turbo HbA1c analyzer, %CV from daily bi-level internal quality control data and %bias(B) from monthly external quality control data covering a 6-month period were calculated. Measurement uncertainty (the top-down method), total analytical error (TAE= B+1.65xCV) and sigmametric (σ = (TEa - B)/CV) were calculated. IFCC biological variation data were used.
RESULTS: The %CV and %bias were found to be 1.8% and 0.57%, respectively. Measurement uncertainty, total analytical error and sigma values for HbA1c were calculated as 4.05, 3.54 and 3.01, respectively. The allowable measurement uncertainty and total analytical error values are 6.7% and 3%. The analytical error value of our laboratory was found to be between desirable and optimum according to biological variation data of IFCC.
CONCLUSIONS: for the HbA1c test working via HPLC method, the data calculated according to the biological variation produced more realistic results. The analytical performance model suitable for the needs and dynamic structure of clinical laboratories and the selection of appropriate analytical targets are very important. According to the modelling system, the points that need to be promoted can be determined and effective corrections can be made.
Keywords: Analytic Chemistry, Hb A1c, HPLC

## P003
## SELÇUK UNIVERSITY FACULTY OF MEDICINE EVALUATION OF THE 6-MONTH QUALITYRNPERFORMANCE OF THE COBAS 6000 BIOCHEMISTRY AUTOANALYZER FOR 2022

Halil Güven, Duygu Eryavuz Onmaz, Sedat Abuşoğlu, Ali Ünlü
Selçuk Univesrity, School of Medicine, Biochemistry Dept., Konya, Türkiye

OBJECTIVES: Today, medical laboratories must establish and implement an appropriate quality system for the accuracy and precision of test results, and therefore patient safety, in accordance with national and international standards. The aim of these quality control processes is to achieve the quality targets determined by the authorities. These quality targets are commonly expressed as the total allowable analytical error. In this study, we aimed to evaluate the method performance parameters of the biochemistry device in our laboratory according to the 6-month internal quality control and external quality control results.
MATERIALS and METHODS: Total Analytical Error (TAH) was calculated by using the percent coefficient of variation (%CV) obtained from the internal quality control results of the 6-month COBAS 6000 autoanalyzer between February 2022-July 2022 and the % BIAS values of the external quality control reports. TAH values were compared with the total allowable analytical error values determined by the Ministry of Health in the laboratory performance evaluation guide published by the Turkish Biochemistry Association.
RESULTS: The TAH values determined by the ministry and found in the Turkish Biochemistry Society laboratory performance evaluation guide vary between 9% and 30% according to the parameters, the CV values vary between 5% and 10%. %CV and TAH levels calculated for all our parameters were below the specific values stated for them.
CONCLUSIONS: The quality performance of our COBAS 6000 autoanalyzer in our laboratory is successful compared to the values allowed by the ministry.

## P004
## EFFECTS OF SAMPLE VOLUME ON SERUM MAGNESIUM ANALYSES IN VACUUM GEL SEPARATOR TUBES

Ayşegül Karaoğlan, Canan Yılmaz, Özlem Gülbahar, Hatice Paşaoğlu
Gazi University, School of Medicine, Medical Biochemistry Dept.

OBJECTIVES: When serum samples are taken into vacuum gel tubes, the level of some analytes may change. In this study, in the blood taken in different brand vacuum gel tubes, the gel; It was investigated whether it had an effect on serum magnesium level.
Materials and Methods: Small (1 ml) and large (5 ml) blood samples were collected randomly from 20 healthy volunteers in vacuum gel tubes of brands A and B. Simultaneously, another sample , was taken into a fifth tube with B brand gelless clot activator, left for 30 minutes, and centrifuged at 3500 rpm for 10 minutes. Magnesium levels were measured in clinical chemistry autoanalyzer with chemiluminescence method in triplicate. The mean of the results of the five tubes were compared with each other.
RESULTS: Magnesium values of small and large amounts of serum taken into A brand tubes were found to be statistically significantly higher than the magnesium results of all B brand tubes ($p<0.001$). No significant difference was found as a result of the comparison of magnesium values of small and large amounts of serum taken into B brand tubes with each other and with the tubes without gel ($p<0.05$).
Conclusions: In our study, it was observed that the high magnesium values detected in the gel tube of brand A were related to the separator gel, and the increase in magnesium levels became more pronounced as the sample volume decreased.
Keywords: laboratory process, error sources

## P005
## METHOD COMPARISON OF 17-OH PROGESTERONE LEVELS IN "SNIBE MAGLUMI X3" AND "AUTOBIO AUTOLUMO" DEVICES

Gülsüm Feyza Türkeş[1], Nesibe Polat[2]
[1] Ankara Atatürk Sanatorium Teaching and Research Hospital, Medical Biochemistry Dept.
[2] Ankara Özel Avicenna Central Laboratory, Medical Biochemistry Dept.

OBJECTIVES: The proposed new method is compared with the current method used in the laboratory, and if an equivalent performance result is obtained, it is decided that it can replace the old method. In this study, we aimed to evaluate the performance of two different commercial devices for the determination of 17-OH Progesterone.
MATERIALS and METHODS: Snibe Maglumi X3 and Autobio Autolumo devices were compared in Ankara Private Avicenna Center Laboratory. Bi-level internal quality control samples were used for reproducibility studies. A total of 98 patient samples at three different levels (low-medium-high) were examined. The difference between methods and its 95% confidence interval were calculated from the standard deviation (Sy/x) of the scatter around the regression line, the regression equation, as provided in the CLSI's manual. Passing Bablok Regression Analysis and Bland Altman Plots were examined.
RESULTS: While Total Analytical Error (TAH) was found to be 18.6% for Snibe device, TAH was 12,4% for Autobio. No significant deviation from linearity was observed in the CUSUM test ($p=0.96$). A very strong correlation was found between the two methods ($r=0.9975$). According to the regression equation, it was determined that the Autobio device 18% lower than Snibe at the 95% confidence interval in the reference interval value. According to the Bland Altman plot, it was observed that the mean value was 6.6% lower.
CONCLUSIONS: Since the %TAH value was below the target TAH value of 30.2%, it was considered acceptable. It is thought that the two devices examined are compatible with each other.
Keywords: method comparison, regresion analysis, 17oh progesterone

## P006
## COMPARISON OF A IMMUNOTURBIDIMETRIC AND HPLC METHODS IN HBA1C DETERMİNATION

Yasemin Yılmaz, Süleyman Demir, Esin Avcı
Pamukkale University, School of Medicine, Medical Biochemistry Dept.

OBJECTIVES: In this study, the Roche Cobas 6000 autoanalyzer using the turbidimetric immunoinhibition (TINIA) method and the Tosoh G8 device using the high performance liquid chromatography (HPLC) method as a reference for HbA1C measurement were compared.
MATERIALS and METHODS: Intraday and interday reproducibility studies were performed with twenty control and patient samples on both analyzers. Linearity and stability studies were performed for both analyzers. Sixty samples, sent for routine HbA1C determination, measured by TOSOH G8 and Roche Cobas 6000 autoanalyzer and the results were compared.
RESULTS: Intraday and interday CVs in control sera were <0.45% and <0.80% in HPLC; It was found to be <1.46% and 1.79% in the TINIA method. For stability study, two blood samples low (5.5%; 37 mmol/mol) and high HbA1C (10.7%; 93 mmol/mol) were determined five times at 0, 2, 4 and 24 hours by HPLC and TINIA method. It was observed that the stability of both HPLC and TINIA method was preserved. In the method comparison made with fresh whole blood samples with HbA1C levels in the range of 4.8%-13.3% (29 mmol/mol-122 mmol/mol) in HPLC, 4.49%-12.01% (26-109 mmol/mol) with the TINIA method. The correlation coefficient of the two methods was $R2=0.987$, $p<0.05$; the regression equation was %HbA1C = 0.903*HPLC %HbA1C +0.159. A significant difference was found between two measurement methods.
CONCLUSIONS: Although the TINIA method correlates well with the HPLC system, its average low HbA1C result of 7.9% may cause problems in the diagnosis and follow-up of diabetes.
Keywords: method comparison, HbA1C, hplc, immunoturbidimetry

## P007
## THE COMPARISON OF 25-HYDROXY VITAMIN D [25(OH)D] RESULTS BETWEEN SNIBE MAGLUMI 4000 AND SIEMENS ADVIA CENTAUR XP

Meltem Yardım[1], Damla Kayalp[2], Nilüfer Çelik[3]
[1] Yerköy State Hostpial, Biochemistry Laboratory
[2] Yozgat City Hostpial
[3] Dr. Behçet Uz Child Disease and Pediatric Surgery Teaching and Research Hospital, Biochemistry Laboratory

OBJECTIVES: Vitamin D, a fat-soluble vitamin, plays a role in regulation of calcium and phosphorus metabolism and bone mineralization. 25(OH)D is the major circulating form of Vitamin D and considered as the best indicator of the amount of vitamin D. This study was assessed to compare a new system for 25(OH)D testing with a widely used and validated system.