

Tesis

**PERBEDAAN KADAR GLUKOSA, NATRIUM, KALIUM, DAN
KLORIDA SERUM BERDASARKAN DURASI DAN
RELATIVE CENTRIFUGAL FORCE
SENTRIFUGASI**



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PERBEDAAN KADAR GLUKOSA, NATRIUM, KALIUM, DAN KLORIDA SERUM BERDASARKAN DURASI DAN *RELATIVE CENTRIFUGAL FORCE* SENTRIFUGASI

Oleh

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ABSTRAK

Latar Belakang: Sentrifugasi untuk persiapan sampel berpengaruh terhadap luaran pemeriksaan laboratorium. *Turnaround time* (TAT) memanjang dapat menyebabkan ketidakpuasan terhadap layanan laboratorium dan memengaruhi tatalaksana terutama pemeriksaan laboratorium yang membutuhkan hasil segera seperti glukosa dan elektrolit (natrium, kalium, dan klorida). Pengurangan durasi sentrifugasi diperlukan untuk memperpendek TAT tanpa mengubah kualitas hasil analisis. Penelitian ini bertujuan untuk mengetahui perbedaan kadar glukosa, natrium, kalium, dan klorida antara spesimen yang disentrifugasi selama 5 menit dengan *relative centrifugal force* (RCF) 3000xg dan 15 menit 1500xg.

Metode: Penelitian analitik dengan rancangan potong lintang dilakukan pada 64 subjek dewasa yang memenuhi kriteria inklusi dan eksklusi. Darah vena dimasukkan ke *BD vacutainer SST II Advance Tubes* dan dipisahkan komponennya menggunakan sentrifus. Jenis parameter yang diperiksa meliputi glukosa, natrium, kalium, dan klorida. Sentrifugasi spesimen dilakukan dengan 2 metode. Tabung pertama disentrifugasi selama 5 menit dengan RCF 3000xg, tabung kedua disentrifugasi selama 15 menit dengan RCF 1500xg. Glukosa, natrium, kalium, dan klorida diperiksa dengan alat kimia klinik otomatis. Data univariat disajikan dalam bentuk rerata dan median, data bivariat dianalisis menggunakan *paired t test* dan Wilcoxon, bermakna jika nilai $p < 0,05$.

Hasil: Rerata usia subjek penelitian 19,71 (1,15) tahun, sebanyak 66,1% adalah perempuan. Kadar parameter laboratorium yang disentrifugasi selama 5 menit 3000xg dan 15 menit 1500xg adalah: glukosa (mg/dL) 90,90 (9,88) dan 90,77 (9,61) $p=0,180$; natrium (mmol/L) 138,67 (4,74) dan 138,38 (4,52) $p=0,075$; kalium (mmol/L) 4,32 (0,32) dan 4,31 (0,33) $p=0,089$; klorida (mmol/L) 100,58 (4,32) dan 100,33 (4,17) $p=0,140$.

Simpulan: Kadar glukosa, natrium, kalium, dan klorida serum pada spesimen yang disentrifugasi 5 menit 3000xg dengan 15 menit 1500xg tidak berbeda.

Saran: *Turnaround time* pemeriksaan glukosa, natrium, kalium, dan klorida dapat diperpendek tanpa memengaruhi hasil pemeriksaan pada sentrifugasi 5 menit 3000xg

Kata kunci: Glukosa, natrium, kalium, klorida, sentrifugasi

DIFFERENCES IN SERUM GLUCOSE, SODIUM, POTASSIUM, AND CHLORIDE LEVELS BASED ON CENTRIFUGATION DURATION AND RELATIVE CENTRIFUGAL FORCE

By

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ABSTRACT

Introduction: Centrifugation for sample preparation affects laboratory test outcomes. Prolonged turnaround time (TAT) can lead to dissatisfaction with laboratory services and impact patient management, particularly in tests requiring immediate results, such as glucose and electrolyte (sodium, potassium, and chloride) analyses. Reducing centrifugation time is necessary to shorten TAT without compromising the quality of analytical results. This study aims to determine differences in glucose, sodium, potassium, and chloride levels between specimens centrifuged for 5 minutes at a relative centrifugal force (RCF) of 3000xg and for 15 minutes at 1500xg.

Methods: This analytical cross-sectional study was conducted on 64 adult subjects who met inclusion and exclusion criteria. Venous blood was collected in BD Vacutainer SST II Advance Tubes and separated by centrifugation. The parameters measured included glucose, sodium, potassium, and chloride. Specimens were centrifuged using two methods. The first tube was centrifuged for 5 minutes at 3000xg, and the second tube was centrifuged for 15 minutes at 1500xg. Glucose, sodium, potassium, and chloride levels were measured with an automated clinical chemistry analyzer. Univariate data were presented as mean and median values, and bivariate data were analyzed using paired t-tests and the Wilcoxon test, with significance set at $p < 0.05$.

Results: The average age of the study subjects was 19.71 (1.15) years, with 66.1% being female. Laboratory parameter levels for samples centrifuged for 5 minutes at 3000xg and 15 minutes at 1500xg were as follows: glucose (mg/dL) 90,90 (9,88) and 90,77 (9,61) $p=0,180$; sodium (mmol/L) 138,67 (4,74) and 138,38 (4,52) $p=0,075$; potassium (mmol/L) 4,32 (0,32) and 4,31 (0,33) $p=0,089$; chloride (mmol/L) 100,58 (4,32) and 100,33 (4,17) $p=0,140$.

Recommendation: The turnaround time for glucose, sodium, potassium, and chloride tests can be shortened without affecting test results when using 5-minute centrifugation at 3000xg.

Keywords: Glucose, sodium, potassium, chloride, centrifugation