

ABSTRACT

Background: The accuracy of laboratory test results is significantly influenced by the pre-analytical phase, one aspect of which is the specimen standing time prior to centrifugation. Total bilirubin testing, as an indicator of liver function, is highly sensitive to changes in pre-analytical conditions. The use of Serum Separator Tubes (SSTs) allows for accelerated serum separation, but variations in standing time prior to centrifugation have the potential to affect test results. In practice, standing time often varies to improve service efficiency. Bilirubin is an analyte that is easily altered by environmental factors and sample conditions, so variations in standing time have the potential to cause differences in results.

Objective: To determine the difference in total bilirubin levels using Serum Separator Tubes with standing times of 5 minutes and 30 minutes before centrifugation.

Methods: This study employed a posttest-only control design and simple random sampling. Each sample was subjected to two treatments: a 5-minute incubation and a 30-minute incubation prior to centrifugation. Total bilirubin levels were measured using the Jendrassik-Grof method. Data analysis was performed using a paired-sample t-test after the normality test was met.

Results: The difference in the mean total bilirubin levels between the 5-minute and 30-minute incubation periods was 0.01 mg/dL. The statistical test results showed a significance value (p-value) of 0.225 ($p > 0.05$), indicating no statistically significant difference between the two treatments, which remained within the Total Error Allowable (TEa) limit of $\pm 20\%$.

Conclusion: There was no significant difference in total bilirubin levels between a 5-minute and a 30-minute standing time prior to centrifugation. This variation in standing time is clinically acceptable and does not significantly affect test results.

Keywords: total bilirubin, serum separator tube, standing time, preanalytical, spectrophotometry.

ABSTRAK

Latar belakang: Akurasi hasil pemeriksaan laboratorium sangat dipengaruhi oleh tahap pra-analitik, salah satunya waktu pendiaman spesimen sebelum sentrifugasi. Pemeriksaan bilirubin total sebagai indikator fungsi hati sangat sensitif terhadap perubahan kondisi pra-analitik. Penggunaan *Serum Separator Tube* (SST) memungkinkan percepatan proses pembentukan serum, namun variasi waktu pendiaman sebelum sentrifugasi berpotensi memengaruhi hasil pemeriksaan. Di lapangan, praktik pendiaman sering bervariasi untuk mengejar efisiensi waktu pelayanan. Bilirubin merupakan analit yang mudah mengalami perubahan akibat faktor lingkungan dan kondisi sampel, sehingga variasi waktu pendiaman berpotensi menimbulkan perbedaan hasil.

Tujuan: Mengetahui perbedaan kadar bilirubin total menggunakan *Serum Separator Tube* dengan waktu pendiaman 5 menit dan 30 menit sebelum disentrifugasi.

Metode: Penelitian ini menggunakan desain *posttest only control design* dan metode *simple random sampling*. Setiap sampel diberi dua perlakuan, yaitu pendiaman 5 menit dan 30 menit sebelum sentrifugasi. Pemeriksaan kadar bilirubin total dilakukan menggunakan metode Jendrassik-Grof. Analisis data dilakukan menggunakan uji *Paired Sample T-test* setelah uji normalitas terpenuhi.

Hasil: Selisih rata-rata kadar bilirubin total pada pendiaman 5 menit dan pendiaman 30 menit sebesar 0,01 mg/dL. Hasil uji statistik menunjukkan nilai signifikansi (*p-value*) sebesar 0,225 ($p > 0,05$), yang berarti tidak terdapat perbedaan yang signifikan secara statistik antara kedua perlakuan, masih berada dalam batas *Total Error Allowable* (TEa) $\pm 20\%$.

Kesimpulan: Tidak terdapat perbedaan yang signifikan kadar bilirubin total antara waktu pendiaman 5 menit dan 30 menit sebelum sentrifugasi. Variasi waktu pendiaman tersebut masih dapat ditoleransi secara klinis dan tidak memengaruhi hasil pemeriksaan secara bermakna.

Kata kunci: bilirubin total, *serum separator tube*, waktu pendiaman, pra-analitik, spektrofotometri.