

ABSTRACT

Background: Delayed centrifugation of blood samples is a common pre-analytical error that can affect the accuracy of blood glucose measurements. This delay allows ongoing glycolysis by blood cells when serum has not been separated, causing measured glucose levels to decrease from their true values. Conventionally, serum is prepared by allowing the blood sample to clot at room temperature for 20–30 minutes before centrifugation. However, when using a Serum Separator Tube (SST), clot formation requires only about 5 minutes before the sample can be centrifuged.

Research Objective: To determine the difference in blood glucose levels in samples collected in Serum Separator Tube (SST) tubes that are either immediate centrifugation or delayed centrifugation after 30 minutes.

Research Method: This type of research is pre-experimental with one-group pretest–posttest design. Serum samples were obtained from 40 fourth-semester students of the Medical Laboratory Technology Department Poltekkes Kemenkes Yogyakarta. Each sample underwent two treatments: immediate centrifugation and delayed centrifugation after 30 minutes. Examination of blood glucose levels is carried out by the GOD-PAP method. Glucose levels were analyzed descriptively and statistically using statistical analysis software.

Results: The mean glucose levels for immediately centrifuged samples was 88.40 mg/dL and samples delayed for 30 minutes before centrifugation averaged 85.78 mg/dL. Although this difference was statistically significant, it remained within the Total Error Allowable limits set by the Clinical Laboratory Improvement Amendments of 8%.

Conclusion: There is a statistically significant difference in blood glucose levels between samples centrifuged immediately and those delayed for 30 minutes in SST tubes; however, the observed discrepancy remains within clinically acceptable error margins.

Keywords: blood glucose, Serum Separator Tube (SST), centrifuge

ABSTRAK

Latar Belakang: Penundaan sentrifugasi sampel darah merupakan salah satu sumber kesalahan pra-analitik yang dapat memengaruhi hasil pemeriksaan kadar glukosa. Salah satu penyebab utamanya adalah proses glikolisis oleh sel darah yang berlangsung apabila serum belum dipisahkan dari sel darah, sehingga kadar glukosa dapat menurun dari hasil sebenarnya. Pembuatan serum diawali dengan pembekuan sampel darah selama 20-30 menit pada suhu ruang kemudian disentrifus. Namun dengan penggunaan tabung *Serum Separator Tube* (SST) hanya memerlukan waktu sekitar 5 menit untuk proses pembekuan sebelum dapat disentrifugasi.

Tujuan Penelitian: Mengetahui perbedaan kadar glukosa pada sampel darah dalam tabung *Serum Separator Tube* (SST) yang segera disentrifus dan didiamkan 30 menit sebelum disentrifus.

Metode Penelitian: Jenis penelitian ini adalah pre eksperimen dengan desain penelitian *one-group pretest-posttest*. Sampel yang digunakan berupa serum dari 40 mahasiswa Jurusan Teknologi Laboratorium Medis Poltekkes Kemenkes Yogyakarta semester 4. Setiap sampel dilakukan dua perlakuan yaitu segera disentrifus dan didiamkan 30 menit sebelum disentrifus. Pemeriksaan kadar glukosa darah dilakukan dengan metode GOD-PAP. Data hasil pemeriksaan kemudian dianalisis secara deskriptif dan statistik menggunakan program *software* analisis statistik.

Hasil Penelitian: Hasil penelitian ini menunjukkan rata-rata kadar glukosa pada sampel yang segera disentrifus sebesar 88,40 mg/dL, sedangkan pada sampel yang didiamkan 30 menit sebelum disentrifus sebesar 85,78 mg/dL. Secara statistik terdapat perbedaan signifikan, namun masih dalam batas *Total Error Allowable* yang ditetapkan oleh *Clinical Laboratory Improvement Amendments* yaitu sebesar 8%.

Kesimpulan: Terdapat perbedaan kadar glukosa pada sampel darah dalam tabung *Serum Separator Tube* (SST) yang segera disentrifus dan didiamkan 30 menit sebelum disentrifus secara statistik namun tetap berada dalam batas kesalahan yang dapat diterima secara klinis.

Kata Kunci: glukosa darah, *Serum Separator Tube* (SST), sentrifus.