

ABSTRACT

Background: A total cholesterol test is used to determine the amount of fat/cholesterol in the blood. Before the test begins, it is important to perform Internal Quality Control (IQC). The samples used in internal quality control are commercial control sera. Samples are typically stored at 2–8°C for short-term storage or in a freezer (–15°C to –20°C) for long-term storage to maintain the stability of the control serum analytes during sample storage.

Research Objective: To determine whether there are differences in total cholesterol levels and the percentage of the average difference in control serum samples tested immediately versus those refrozen through three freeze-thaw cycles.

Research Method: This study employed a quasi-experimental design with a one-group pretest-posttest design. The sample consisted of 1 vial of commercial control serum divided into 33 serum cups (aliquots). Total cholesterol levels in the control serum were measured immediately and then re-measured every 2 days for 6 days following refreezing. Total cholesterol levels were measured using the Cholesterol Oxidase-Peroxidase Aminoantipyrine (CHOD-PAP) method at a wavelength of 500nm.

Research Results: The percentage difference in the average total cholesterol levels between samples tested immediately and those refrozen through one freeze-thaw cycle, two freeze-thaw cycles, and three freeze-thaw cycles, respectively, was 9.22%, 15.80%, and 3.23%. Statistical analysis using the Wilcoxon test yielded a p-value of 0.000 ($p < 0.05$), indicating a significant difference in total cholesterol levels between the control serum tested immediately and that refrozen through three freeze-thaw cycles.

Conclusion: There is a difference in the mean total cholesterol levels between control serum samples examined immediately and those refrozen through three freeze-thaw cycles.

Keywords : Cholesterol, control serum, freezing

ABSTRAK

Latar Belakang: Pemeriksaan kadar kolesterol total merupakan pemeriksaan untuk mengetahui jumlah lemak/kolesterol di dalam darah. Sebelum pemeriksaan dimulai penting untuk melakukan Pemantapan Mutu Internal (PMI). Sampel yang digunakan dalam pemantapan mutu internal adalah serum kontrol komersial. Sampel biasanya disimpan pada suhu 2-8°C untuk jangka waktu pendek atau di dalam *freezer* (-15°C hingga -20°C) untuk penyimpanan jangka Panjang guna menjaga stabilitas analit serum kontrol selama penyimpanan sampel.

Tujuan Penelitian: Mengetahui ada perbedaan kadar kolesterol total dan presentase selisih rata-rata pada serum kontrol segera diperiksa dan dibekukan ulang melalui tiga kali siklus beku-cair (*freeze-thaw cycle*).

Metode Penelitian: Jenis penelitian ini menggunakan *quasi experimental* dengan desain *one group pretest-posttest*. Sampel berupa 1 vial serum kontrol komersial yang dibagi ke dalam 33 cup serum (alikuot). Pemeriksaan kadar kolesterol total pada serum kontrol dilakukan segera dan dibekukan ulang diperiksa setiap 2 hari sekali selama 6 hari. Pengukuran kadar kolesterol total dilakukan menggunakan metode *Cholesterol Oxidase-Peroxidase Aminoantipyrine* (CHOD-PAP) pada panjang gelombang 500 nm.

Hasil Penelitian: Persentase selisih rata-rata kadar kolesterol total antara segera diperiksa dengan dibekukan ulang melalui satu siklus beku-cair, dua siklus beku-cair dan tiga siklus beku-cair secara berurutan adalah 9,22%; 15,80% dan 3,23%. Hasil uji statistik dengan *Wilcoxon* diperoleh nilai signifikansi 0,000 ($p < 0,05$) yang menunjukkan adanya perbedaan kadar kolesterol total pada serum kontrol segera diperiksa dan dibekukan ulang melalui tiga kali siklus beku-cair (*freeze-thaw cycle*).

Kesimpulan: Ada perbedaan rata-rata kadar kolesterol total pada serum kontrol segera diperiksa dan dibekukan ulang melalui tiga kali siklus beku- cair (*freeze-thaw cycle*).

Kata Kunci : Kolesterol, serum kontrol, pembekuan