

**PENGARUH PENAMBAHAN Anti-Rh PADA SERUM HEMOLISIS
SEDANG TERHADAP AKTIVITAS ENZIM *ALANINE*
AMINOTRANSFERASE (ALT)**

Annisa Diyah Utami¹, Ratih Hardisari², Dhika Juliana Sukmana³
^{1,2,3} Jurusan Teknologi Laboratorium Medis Poltekkes Kemenkes Yogyakarta
Jl. Ngadinegaran MJ No.62, Mantrijeron, Yogyakarta
Email: annisadiyahu@gmail.com

ABSTRAK

Latar Belakang : Hemolisis merupakan kesalahan praanalitik (53,2%) yang mengganggu pemeriksaan *Alanine Aminotransferase* (ALT) akibat pelepasan enzim intraseluler dan interferensi spektral hemoglobin bebas pada panjang gelombang 340 nm. Penambahan reagen anti-Rh berpotensi menjadi alternatif penanganan melalui aglutinasi fragmen membran eritrosit.

Tujuan : Mengetahui pengaruh penambahan reagen anti-Rh pada serum hemolisis sedang terhadap aktivitas enzim ALT.

Metode : Desain *quasi experimental* menggunakan 33 unit *pooled sera* pada tiga kelompok: serum normal, hemolisis sedang, dan hemolisis sedang ditambah anti-Rh. Hemolisis diinduksi *in vitro* dan diverifikasi dengan metode Harboe. Pemeriksaan ALT menggunakan metode kinetik IFCC (λ 340 nm). Analisis data menggunakan *Repeated Measures ANOVA* dan *Pairwise Comparisons*

Hasil : Rerata ALT serum normal 23,05 U/L, meningkat signifikan pada serum hemolisis sedang (29,83 U/L). Penambahan anti-Rh sedikit menurunkan menjadi (28,35 U/L). Uji *Repeated Measures ANOVA* menunjukkan perbedaan bermakna antarketiga kelompok ($p=0,001$). Uji *Pairwise Comparisons* menunjukkan perbedaan tidak bermakna antara serum hemolisis sedang dengan serum penambahan anti-Rh ($p=0,418$).

Kesimpulan : Penambahan anti-Rh hanya menurunkan aktivitas ALT secara parsial melalui pengurangan kekeruhan fragmen membran eritrosit, tetapi belum mampu mengembalikan hasil setara serum normal karena hemoglobin bebas tetap terlarut.

Kata Kunci: Anti-Rh, Hemolisis Sedang, *Alanine Aminotransferase* (ALT), Praanalitik, Interferensi

THE EFFECT OF ADDING Anti-RH TO MODERATELY HEMOLYZED SERUM ON ALANINE AMINOTRANSFERASE (ALT) ENZYME ACTIVITY

Annisa Diyah Utami¹, Ratih Hardisari², Dhika Juliana Sukmana³
^{1,2,3} Jurusan Teknologi Laboratorium Medis Poltekkes Kemenkes Yogyakarta
Jl. Ngadinegaran MJ No.62, Mantrijeron, Yogyakarta
Email: annisadiyahu@gmail.com

ABSTRACT

Background: Hemolysis is a preanalytical error (53,2%) that interferes with alanine aminotransferase (ALT) testing due to the release of intracellular enzymes and spectral interference from free hemoglobin at a wavelength of 340 nm. The addition of anti-Rh reagent has the potential to serve as an alternative treatment by agglutinating erythrocyte membrane fragments.

Objective: To determine the effect of adding anti-Rh reagent to serum with moderate hemolysis on ALT enzyme activity.

Methods: A quasi-experimental design was used with 33 units of pooled serum divided into three groups: normal serum, moderate hemolysis, and moderate hemolysis plus anti-Rh. Hemolysis was induced in vitro and verified using the Harboe method. ALT was measured using the IFCC kinetic method (λ 340 nm). Data were analyzed using Repeated Measures ANOVA and Pairwise Comparisons.

Results: The mean ALT level in normal serum was 23,05 U/L, which increased significantly in serum with moderate hemolysis (29,83 U/L). The addition of anti-Rh slightly reduced the level to 28,35 U/L. The Repeated Measures ANOVA test showed a significant difference among the three groups ($p = 0,001$). The Pairwise Comparisons test showed no significant difference between the moderate hemolysis serum and the anti-Rh-treated serum ($p = 0,418$).

Conclusion: The addition of anti-Rh only partially reduced ALT activity by decreasing the turbidity of erythrocyte membrane fragments, but was not able to restore results equivalent to those of normal serum because free hemoglobin remained dissolved.

Keywords: Anti-Rh, Moderate Hemolysis, Alanine Aminotransferase (ALT), Pre-analytical Phase, Interference.