

PERBEDAAN KADAR HEMOGLOBIN MENGGUNAKAN TEKNIK HOMOGENISASI *SHAKING* DAN INVERSI PADA TABUNG MIKRO EDTA

Maya Dian Dakabesy¹, Suyana, S.Si, M.Biotech², Ullya Rahmawati, S.ST, M.KL.³

^{1,2,3} Jurusan Teknologi Laboratorium Medis, Poltekkes Kemenkes Yogyakarta, Jalan Ngadinegaran MJ
3 No. 62, Mantrijeron, Kota Yogyakarta, 55141

Email : diandiandakabesy@gmail.com

ABSTRAK

Latar belakang : Teknik homogenisasi darah EDTA merupakan tahap pra-analitik yang dapat memengaruhi hasil pemeriksaan hemoglobin. Homogenisasi yang tidak sesuai berisiko menyebabkan hemolisis dan memengaruhi kadar hemoglobin.

Tujuan penelitian: Untuk mengetahui perbedaan kadar hemoglobin dalam sampel darah kapiler dalam tabung mikro K3EDTA dengan teknik *shaking* dan inversi.

Metode Penelitian: Penelitian eksperimen murni dengan desain split-sample pada 16 responden (32 sampel darah kapiler). Sampel dibagi menjadi dua kelompok perlakuan, yaitu teknik *shaking* dan teknik inversi. Pemeriksaan hemoglobin dilakukan menggunakan *Hematology Analyzer Beckman Coulter DxH 500*. Analisis data menggunakan uji normalitas Shapiro-Wilk dan uji Paired Sample T-test.

Hasil Penelitian: Rerata kadar hemoglobin teknik *shaking* sebesar 13,38 gr/dL dan teknik inversi sebesar 14,04 gr/dL. Hasil uji statistik menunjukkan terdapat perbedaan signifikan antara kedua teknik homogenisasi ($p = 0,017$). *Mean difference* sebesar 0,663 gr/dL dengan persentase perbedaan 4,7%. Nilai tersebut masih berada dalam batas *Total Allowable Error* (TEa) hemoglobin menurut pedoman *Clinical Laboratory Improvement Amendments* yaitu $\pm 7\%$

Kesimpulan: Teknik homogenisasi *shaking* dan inversi menunjukkan perbedaan signifikan secara statistik, namun masih dapat diterima secara klinis. Teknik inversi tetap lebih direkomendasikan karena merupakan gold standard homogenisasi darah EDTA.

Kata Kunci: Kadar Hemoglobin, Teknik Homogenisasi, *Shaking*, Inversi.

DIFFERENCES IN HEMOGLOBIN LEVELS USING SHAKING AND INVERSION HOMOGENIZATION TECHNIQUES IN EDTA MICROTUBE

Maya Dian Dakabesy¹, Suyana, S.Si, M.Biotech², Uliya Rahmawati, S.ST, M.KL.³

^{1,2,3} Jurusan Teknologi Laboratorium Medis, Poltekkes Kemenkes Yogyakarta, Jalan Ngadinegaran MJ
3 No. 62, Mantrijeron, Kota Yogyakarta, 55141

Email : diandiandakabesy@gmail.com

ABSTRACT

Introduction: The EDTA blood homogenization technique is a pre-analytical step that can affect hemoglobin test results. Improper homogenization risks hemolysis and affects hemoglobin levels.

Purpose: To determine the differences in hemoglobin levels in capillary blood samples in K3EDTA micro tubes using shaking and inversion techniques.

Methods: A pure experimental study with a split-sample design on 16 respondents (32 capillary blood samples). The samples were divided into two treatment groups, namely the shaking technique and the inversion technique. Hemoglobin examination was performed using a Beckman Coulter DxH 500 Hematology Analyzer. Data analysis used the Shapiro-Wilk normality test and the Paired Sample T-test.

Result: The mean hemoglobin level using the shaking technique was 13.38 g/dL and the inversion technique was 14.04 g/dL. Statistical test results showed a significant difference between the two homogenization techniques ($p = 0.017$). The mean difference was 0.663 g/dL, with a percentage difference of 4.7%. This value is still within the Total Allowable Error (TEa) limit for hemoglobin according to the Clinical Laboratory Improvement Amendments guidelines, which is $\pm 7\%$.

Conclusion: The shaking and inversion homogenization techniques showed statistically significant differences, but were still clinically acceptable. The inversion technique remains the gold standard for EDTA blood homogenization.

Keyword : Hemoglobin Level, Homogenization Technique, Shaking, Inversion