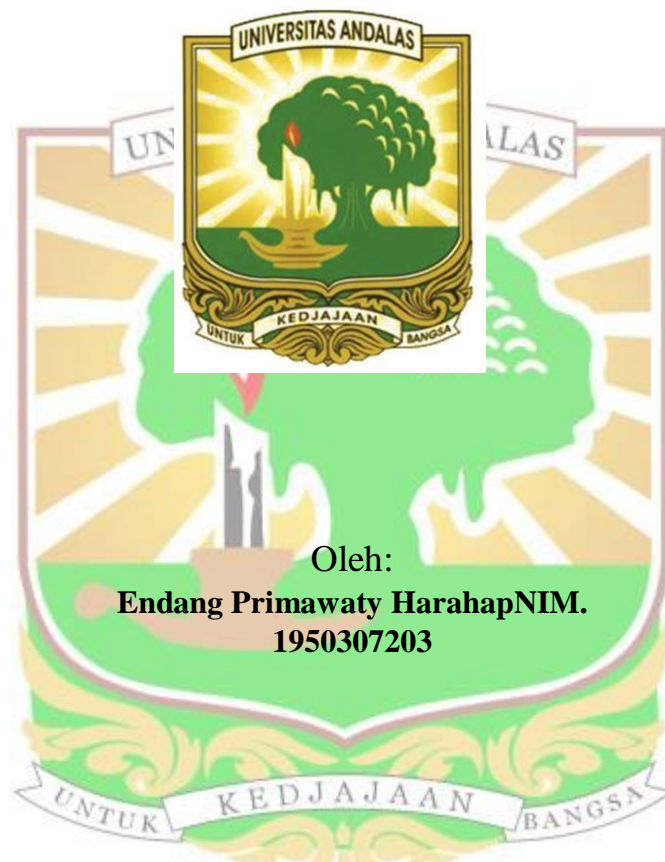


Tesis

**PERBEDAAN KADAR HEMOGLOBIN, AST, LDH, DAN KALIUM
ANTARA SPESIMEN YANG DIKIRIM MENGGUNAKAN
PNEUMATIC TUBE SYSTEM DENGAN
TRANSPOR MANUAL**



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ABSTRAK

PERBEDAAN KADAR HEMOGLOBIN, AST, LDH, DAN KALIUM ANTARA SPESIMEN YANG DIKIRIM MENGGUNAKAN *PNEUMATIC TUBE SYSTEM* DENGAN TRANSPOR MANUAL

Oleh:

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Latar Belakang: Penggunaan PTS mempercepat transportasi spesimen ke laboratorium, namun spesimen dapat mengalami percepatan/perlambatan mendadak, kecepatan tinggi, perubahan tekanan udara, pergerakan spesimen dalam tabung, dan getaran, sehingga menyebabkan hemolisis. Transpor manual dapat menyebabkan pemeriksaan tertunda dan akan terjadi pergerakan cairan ke dalam sel, sehingga sel akan mengalami hemolisis. Hemolisis menyebabkan terlepasnya hemoglobin dan komponen intraselular eritrosit ke dalam serum yang berpotensi meningkatkan kadar Hb serum, AST, LDH, dan kalium. Penelitian ini bertujuan untuk mengetahui perbedaan kadar Hb serum, AST, LDH, dan kalium antara spesimen yang dikirim menggunakan PTS dengan transpor manual di RSUP Dr. M. Djamil Padang.

Metode: Penelitian potong lintang terhadap 40 subjek dewasa sehat di Instalasi Laboratorium Sentral RSUP Dr. M. Djamil Padang mulai bulan April 2023 sampai Oktober 2023. Pengambilan darah vena dilakukan secara aseptik menggunakan *vacutainer* di regio *fossa cubiti*. Dua tabung disiapkan dan masing-masing dimasukkan 3 mL darah vena. Pengiriman spesimen dilakukan dari jarak yang sama (1500 m) dengan dua metode. Tabung pertama dikirim menggunakan PTS dengan kecepatan 6 m/detik, sedangkan tabung kedua secara transpor manual. Hemoglobin serum diperiksa menggunakan alat *hematology analyzer*, AST dan LDH diperiksa menggunakan alat kimia klinik otomatis, dan kalium diperiksa menggunakan *electrolyte analyzer*. Data dianalisis dengan uji Mann Whitney dan *independent sample t test*, bermakna jika nilai $p < 0,05$.

Hasil: Rerata umur subjek penelitian adalah 31,6 (5,5) tahun dan mayoritas berjenis kelamin perempuan (85%). Perbedaan kadar Hb serum (g/dL), AST (U/L), LDH (U/L), dan kalium (mmol/L) yang dikirim menggunakan PTS dan transpor manual secara berturut-turut adalah 0,0 (0,0-0,3) vs 0,0 (0,0-0,3) dengan nilai $p = 0,873$; 16,99 (4,7) vs 16,49 (4,01) dengan nilai $p = 0,607$; 175,7 (31,6) vs 172,5 (31,8) dengan nilai $p = 0,650$; dan 4,14 (0,23) vs 4,04 (0,24) dengan nilai $p = 0,056$.

Simpulan: Tidak didapatkan perbedaan bermakna kadar Hb serum, AST, LDH, dan kalium antara spesimen yang dikirim menggunakan PTS 1500 m dengan transpor manual.

Kata kunci: *Pneumatic tube system*, transpor manual, hemoglobin, AST, LDH,

kalium



ABSTRACT

THE DIFFERENCES HEMOGLOBIN, AST, LDH AND POTASSIUM LEVELS BETWEEN SPECIMEN SENT USING PNEUMATIC TUBE SYSTEM WITH MANUAL TRANSPORT

By:

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Background: *The use of PTS speeds up transportation of specimens to the laboratory, but specimens can experience exposure to pressure, sudden acceleration/deceleration, high speeds, changes in air pressure, movement of the specimen in the tube, and vibration, thereby causing hemolysis. Manual transport can also cause the examination to be delayed and there will be movement of fluid into the cells, so that the cells will experience hemolysis. Hemolysis causes the release of hemoglobin and intracellular components of erythrocytes into the serum, thereby potentially increasing serum Hb, AST, LDH and potassium levels. This study aims to determine differences in serum Hb, AST, LDH and potassium levels between specimens sent using PTS with manual transport at RSUP Dr. M. Djamil Padang.*

Methods: *Cross-sectional study of 40 healthy adult subjects at the Central Laboratory Installation of Dr. RSUP. M. Djamil Padang from April 2023 to October 2023. Venous blood collection was carried out using a vacutainer in the cubital fossa region. Two tubes were prepared and 3 mL of venous blood was inserted into each. Specimen delivery was carried out from the same distance (1500m) by two methods. The first tube was sent using PTS at a speed of 6 m/second, while the second tube was transported manually. Serum hemoglobin was checked using a hematology analyzer, AST and LDH were checked using an automatic clinical chemistry tool, and potassium was checked using an electrolyte analyzer. Data were analyzed using the Mann Whitney test and independent sample t test, significant if the p value <0.05.*

Results: *The average age of the research subjects was 31.6 (5.5) years and the majority were female (85%). The difference in serum Hb (g/dL), AST (U/L), LDH (U/L), and potassium (mmol/L) levels sent using PTS and manual transport respectively was 0.0(0.0 -0.3) vs 0.0(0.0-0.3) with p value =0.873; 16.99 (4.7) vs 16.49 (4.01) with p value =0.607; 175.7(31.6) vs 172.5(31.8) with p value =0.650; and 4.14(0.23) vs 4.04(0.24) with p value =0.056.*

Conclusion: *There were no significant differences in serum Hb, AST, LDH and potassium levels between specimens sent using PTS and manual transport.*

Key words: *Pneumatic tube system, manual transport, AST, LDH, potassium*