ANALISIS HUBUNGAN ANTARA KADAR *LACTATE DEHYDROGENASE* (LDH) DENGAN DURASI PENYIMPANAN PADA *WHOLE BLOOD* (WB) DAN *PACKED RED CELLS* (PRC)

INTISARI

Latar belakang: Selama penyimpanan, eritrosit akan mengalami perubahan biomekanika yang disebut sebagai *storage lesion*. *Storage lesion* akan membuat eritrosit mengalami hemolisis. Hemolisis akan melepaskan LDH ke dalam plasma. Tingginya kadar LDH yang dikandung dan dilepaskan eritrosit membuat LDH menjadi instrumen penilaian kualitas *in vitro* produk darah.
Tujuan: Menganalisis peningkatan kadar LDH pada produk darah WB dan PRC pada durasi penyimpanan 1, 3, 7, 14, dan 28 hari, menganalisis korelasi antara kadar LDH dengan durasi penyimpanan produk darah WB dan PRC, dan menganalisis perbedaan peningkatan kadar LDH antara produk darah WB dengan PRC.
Metode: Penelitian ini menggunakan metode observasional dengan desain *cross-sectional*. Sampel yang digunakan adalah sebanyak 11 kantong produk darah WB dan 10 kantong produk darah PRC. Produk darah disimpan di *refrigerator* bersuhu 2-6°C dengan pengambilan darah pada durasi penyimpanan hari ke-1, 3, 7, 14, dan 28. Kadar LDH diukur di laboratorium kimia darah menggunakan *Beckman Chemistry Analyzer* dengan satuan IU/L.
Hasil: Terdapat peningkatan bermakna kadar LDH mulai hari ke-7 penyimpanan pada kedua produk darah ($p = 0,006$; $p = 0,005$). Korelasi antara kadar LDH dengan durasi penyimpanan menunjukkan korelasi yang searah, sangat kuat, dan bermakna kedua produk darah ($r = 0,772$; $r = 0,835$; $p<0,05$). Peningkatan kadar LDH PRC lebih tinggi dan bermakna dibandingkan dengan kadar LDH WB mulai hari ke-7 penyimpanan ($p<0,05$).
Kesimpulan: Terdapat peningkatan bermakna kadar LDH pada produk darah WB dan PRC selama penyimpanan 7, 14, dan 28 hari. Korelasi antara kadar LDH dengan durasi penyimpanan bersifat searah dan sangat kuat. Peningkatan kadar LDH PRC lebih tinggi dan bermakna dibandingkan dengan kadar LDH WB selama penyimpanan 7, 14, dan 28 hari.
Kata kunci: Penyimpanan darah, *storage lesion*, hemolisis, kadar LDH.

THE RELATIONSHIP ANALYSIS BETWEEN THE LEVEL OF LACTATE DEHYDROGENASE (LDH) WITH THE STORAGE DURATION IN WHOLE BLOOD AND PACKED RED CELLS PRODUCTS

ABSTRACT

Backgrounds: During the blood storage, erythrocytes suffered from biomechanical alterations called the "storage lesion". This "storage lesion" caused the erythrocytes to hemolyse. The hemolysis released large amount of LDH into the plasma. The high level of LDH that was contained and released by erythrocytes during hemolysis made it an adequate instrument to assess the quality of *in vitro* blood products.
Objectives: This study has been done to analyse the alteration of LDH level at day 1, 3, 7, 14, and 28 in the WB and PRC product, to analyse the correlation between the LDH level with the storage duration in both blood products, also to analyse the enhancement differences of LDH level between the WB products and PRC products.
Methods: This research used the observational method with a *cross-sectional* design. There were 11 bags of WB and 10 bags of PRC that were used as the samples. Blood products were kept in the refrigerator with the temperature range of 2-6°C. The LDH level was measured with using the Beckman Chemistry Analyzer device.
Results: There were statistically significant alterations of LDH level started from day 7 of storage in both blood products ($p<0,05$). The correlation between LDH level with the storage duration were found to be positive, very strong, and significant also in both blood products ($r = 0,772$; $r = 0,835$; $p<0,05$). The enhancement differences were found to be higher and significant in the PRC product started from day 7 of storage ($p<0,05$).
Conclusion: There were significant increase of LDH level started from day 7 of storage both in WB and PRC products. The correlation between LDH level with the storage duration were positive, very strong, and significant. The enhancement differences of LDH level were higher and significant in the PRC product started from day 7 of storage.
Keywords: Blood storage, storage lesion, hemolysis, LDH level.