Potensi hemolisis dan keunggulan penggunaan Komponen darah PRC washed erythrocyte dan leukodepleted (in-line) dalam transfusi klinis = The potential of hemolysis and the advantage of washed erythrocyte and leukodepleted PRC (in-line) blood components in blood transfusion practice

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Abstrak

[ABSTRAK
Latar belakang. Komponen darah washed erythrocyte (WE) mempunyai fungsi yang sama dengan leukodepleted PRC (LD-PRC) yaitu untuk mencegah atau mengurangi reaksi transfusi. Namun banyak kekhawatiran para klinisi tentang cara pembuatan komponen darah WE dan bahan yang terkandung pada filter leukosit untuk menangkap leukosit. Tujuan utama dari penelitian ini adalah memberikan bukti secara ilmiah akan keamanan dalam pemakaian komponen darah PRC yang telah dimodifikasi ini dan juga memberikan pemahaman tentang pemakaian yang benar untuk komponen darah ini. Metoda. Penelitian ini menggunakan desain potong lintang pada 52 sampel darah. Pemeriksaan darah dilakukan pada 26 sampel WE sebelum dan sesudah menjadi komponen darah WE dan 26 sampel LD-PRC sebelum dan sesudah menjadi komponen darah LD-PRC. Pemeriksaan hematologi diperiksa secara otomatis menggunakan Sysmex Xn-2000, total protein diperkirakan menggunakan ADVIA 1650/1800, sedangkan hemolisis darah diamati menggunakan uji Osmotic Fragility Test (OFT). Hasil. Menunjukan kadar hemoglobin pada kelompok WE berkurang 15,4%, volume hematokrit menurun 8,55%, kadar protein menurun 98,4 %, dan jumlah leukosit menurun 87,31% dibandingkan dengan kelompok PRC sebelum dicuci. Selain itu, kadar hemoglobin dari komponen darah leukodepleted menurun 29,1%, volume hematokrit meningkat 21%, kadar protein menurun 79,1% dan jumlah leukosit menurun 99,9% dibandingkan dengan kelompok WB sebelum dijadikan komponen leukodepleted PRC. Persentase hemolisis pada komponen darah WE dan LD-PRC adalah < 0,8% Perbedaan bermakna komponen darah WE dan LD-PRC dapat diamati pada parameter penilaian protein sisa dan leukosit sisa (p<0,05). Simpulan. Dalam pembuatan komponen darah WE protein plasma berkurang sebanyak 98,4%, sedangkan dalam pembuatan leukodepleted PRC, jumlah leukosit berkurang sebanyak 99,97%. Terjadinya hemolisis dapat diabaikan karena pada kedua komponen darah, hemolisis terjadi < 0,8%. Jika diperlukan komponen darah dengan kandungan protein plasma yang sedikit dapat digunakan komponen darah WE, sementara itu jika diperlukan komponen darah dengan jumlah leukositnya sedikit dapat digunakan/dipilih komponen darah leukodepleted.
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ABSTRACT
Background. Washed erythrocyte (WE) and leukodepleted erythrocyte (LD-PRC) are normally used in clinical transfusion to prevent transfusion reaction. However, clinicians are wondering on the safety of those two blood components. The open system with saline for erythrocyte washing and the use of filter for blood leukodepletion still leave quiries on the possibility of hemolysis and their effectiveness for clinical transfusion. This study aims to provide scientific reasoning and the appropriate use of WE and leukodepleted blood respectively. Methods. A cross sectional approach was employed in this study on two

groups of blood component consisting of 52 blood samples each , i.e. WE and LD-PRC respectively. Blood examinations were carried out on 26 WE samples prior to and after washing and on 26 LD-PRC samples prior to and after leukodepletion. Blood indices were examined automatically using Sysmex Xn-2000, total protein was estimated using ADVIA 1650/1800, while blood hemolysis was observed employing Osmotic Fragility Test (OFT). Results. It was shown that hemoglobin concentration of WE group decreased by 15.4%, hematocrit volume decreased by 8.55%, protein concentration decreased by 98.4%, and leukocyte count decreased by 87.3% compared to those the original Packed Red Cells. In addition, it was shown that the hemoglobin concentration of the leucodepleted blood component decreased by 29.1%, hematocrit volume increased by 21%, protein concentrations decreased 79.1% and the leukocyte count decreased by 99.9%. All the sampel of the WE blood products and all the LD-PRC blood sampel has hemolysis level <0,8% However, a significant difference in protein concentration and leukocyte count was observed betwen WE and LD-PRC ($p<0.05$). Conclusion. The process of erythrocytes? washing decreased the plasma protein concentration by 98.4%, whilst the process of leucodepletion decreased the leucocyte count by 99.97%. Hemolysis during the preparation of both blood components could be negligible. It is concluded that WE blood component is preferable for transfusion when low plasma protein is required. On the other hand, leukodepleted PRC is preferable when blood component with low in leucocyte count is required.;Background. Washed erythrocyte (WE) and leukodepleted erythrocyte (LD-PRC) are normally used in clinical transfusion to prevent transfusion reaction. However, clinicians are wondering on the safety of those two blood components. The open system with saline for erythrocyte washing and the use of filter for blood leukodepletion still leave quiries on the possibility of hemolysis and their effectiveness for clinical transfusion. This study aims to provide scientific reasoning and the appropriate use of WE and leukodepleted blood respectively. Methods. A cross sectional approach was employed in this study on two groups of blood component consisting of 52 blood samples each , i.e. WE and LD-PRC respectively. Blood examinations were carried out on 26 WE samples prior to and after washing and on 26 LD-PRC samples prior to and after leukodepletion. Blood indices were examined automatically using Sysmex Xn-2000, total protein was estimated using ADVIA 1650/1800, while blood hemolysis was observed employing Osmotic Fragility Test (OFT). Results. It was shown that hemoglobin concentration of WE group decreased by 15.4%, hematocrit volume decreased by 8.55%, protein concentration decreased by 98.4%, and leukocyte count decreased by 87.3% compared to those the original Packed Red Cells. In addition, it was shown that the hemoglobin concentration of the leucodepleted blood component decreased by 29.1%, hematocrit volume increased by 21%, protein concentrations decreased 79.1% and the leukocyte count decreased by 99.9%. All the sampel of the WE blood products and all the LD-PRC blood sampel has hemolysis level <0,8% However, a significant difference in protein concentration and leukocyte count was observed betwen WE and LD-PRC ($p<0.05$). Conclusion. The process of erythrocytes' washing decreased the plasma protein concentration by 98.4%, whilst the process of leucodepletion decreased the leucocyte count by 99.97%. Hemolysis during the preparation of both blood components could be negligible. It is concluded that WE blood component is preferable for transfusion when low plasma protein is required. On the other hand, leukodepleted PRC is preferable when blood component with low in leucocyte count is required., Background. Washed erythrocyte (WE) and leukodepleted erythrocyte (LD-PRC) are normally used in clinical transfusion to prevent transfusion reaction. However, clinicians are wondering on the safety of those two blood components. The open system with saline for erythrocyte washing and the use of filter for blood leukodepletion still leave quiries on the possibility of hemolysis and their effectiveness for clinical

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