# Pengaruh Transfusi Packed Red Cell pada Kadar NT-proBNP pada Anak Sakit Kritis = Effect of Packed Red Cell Transfusion on NT-proBNP Levels In Critically Ill Children

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Abstrak

Latar belakang : Anemia akut sering terjadi pada anak sakit kritis yang dirawat di PICU, memiliki konsekuensi hipoksia global yang dapat mengakibatkan disfungsi miokardium. Transfusi PRC masih menjadi salah satu pilihan dalam rangka memperbaiki oksigenasi dan kinerja jantung saat terjadi anemia. Bukti-bukti pengaruh transfusi pada perbaikan performa jantung masih terbatas.
Tujuan : Mengevaluasi kadar NT-proBNP, pasokan oksigen, indeks inotropi dan rasio energi potensial:energi gerak pada jantung sebelum dan sesudah transfusi PRC pada anak sakit kritis yang mengalami anemia akut.
Metode : Penelitian analitik observasional potong lintang sejak April sampai Agustus 2019 pada anak usia 1 bulan-18 tahun dengan sakit kritis yang dirawat di PICU RSUPN Dr. Cipto Mangunkusumo. Penilaian hemodinamik menggunakan USCOM.
Hasil : Penelitian ini melibatkan 31 subyek dengan median umur 3,6 tahun (rentang 0,1-17,5 tahun). Kadar Hb naik sebesar 29,1±15,9% setelah mendapat transfusi PRC 9±3,3 mL/KgBB. Rerata kadar hemoglobin sebelum dan sesudah transfusi adalah 7,94±1,46 dan 10,17±1,92 g/dL (p<0,000 IK 95%: 1,80-2,64). Kadar NT-proBNP meningkat tak bermakna sebesar 12% (-77,0-199) setelah transfusi dari 4214±6678 menjadi 5182±8327 pg/mL (p=0,186 IK 95%: -493-2428). Tidak terdapat korelasi antara persen perubahan Hb dan NT-proBNP (Spearman correlation r=0,124; p=0,505). Terdapat kenaikan pasokan oksigen pasca transfusi sebesar 20,7±38,9% dan berkorelasi dengan kanaikan hemoglobin (Pearson correlation r=0,39; p=0,029). Uji Chi-square menunjukkan adanya hubungan bermakna antara kelompok yang mengalami kenaikan DO dengan perbaikan indeks inotropi (uji Chi square, p=0,031) dan perbaikan PKR (p=0,008), namun tak ada hubungan dengan perubahan NT-proBNP (p=0,511).
Simpulan : Tidak terdapat perubahan bermakna kadar NT-proBNP sebelum dan sesudah transfusi PRC pada anak sakit kritis yang mengalami anemia akut. Peningkatan pasokan oksigen pasca transfusi PRC berkorelasi dengan peningkatan indeks inotropi (Smith-Madigan Inotropy Index) dan perbaikan potensial to kinetic ratio (PKR)
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Background: Acute anemia often occurs in critically ill children in PICU, which has global hypoxic consequences resulting myocardial dysfunction. Transfusion of PRC is still choosen in order to improve oxygenation and cardiac performance during anemia. Evidence of the effect of transfusion on improving cardiac performance is still limited.
Objective: To evaluate NT-proBNP levels, delivery oxygen (DO2), inotropy index and the potential to kinetic energy ratio (PKR) of heart before and after PRC transfusion in

critically ill children with acute anemia.
Methods: A cross-sectional observational analytic study conducted from April to August 2019 in children aged 1 month-18 years cared in PICU Dr. Cipto Mangunkusumo Hospital. Hemodynamic assessment using USCOM.
Results: This study involved 31 subjects with a median age of 3.6 years (range 0.1-17.5 years). Hb levels increased by 29.1±15.9% after receiving a 9±3.3 mL / KgBB transfusion PRC. The mean hemoglobin levels before and after the transfusion were 7.94±1.46 and 10.17±1.92 g / dL (p <0.000; CI 95%: 1.80-2.64). NT-proBNP levels slight increased but not statistically sgnificant by 12%(-77.0 - 199) after PRC transfusion from 4214±6678 to 5182±8327 pg/mL (p = 0.186; CI 95%: -493 - 2428). There was no correlation between percent change in Hb and NT-proBNP (Spearman correlation r=0.124; p=0.505). There was increasing in DO2 after transfusion by 20.7±38.9% and correlated with increased hemogolobin (Pearson correlation r=0.39; p=0.029). Chi-square test showed a significant relationship between groups that experienced an increase in DO2 with an improvement in the inotropy index (Chi square test, p=0.031) and improvement in PKR (p=0.008), but there was no relationship with NT-proBNP changes (p=0.511) .
Conclusions: There was no significant change in NT-proBNP levels before and after PRC transfusion in critically ill children who had acute anemia. Increased DO2 after PRC transfusion correlates with an increase in the inotropy index (Smith-Madigan Inotropy Index) and improvement in potential to kinetic ratio (PKR).