

## INTISARI

**Latar belakang:** Transfusi menggunakan *Packed Red Cell* (PRC) sering dibutuhkan pasien keganasan yang mengalami kondisi anemia akibat dari perjalanan penyakit, efek samping terapi, defisiensi nutrisi, dan proses inflamasi kronis. Masa simpan suatu produk PRC memiliki pengaruh terhadap perubahan biokimiawi maupun biomekanik yang dikenal dengan istilah *red cell storage lesion*. Salah satu perubahan yang terjadi adalah peningkatan kadar sitokin proinflamasi yang dihasilkan oleh lekosit kontaminan selama PRC disimpan, salah satunya adalah interleukin-1 (IL-1). Adanya sitokin proinflamasi berkaitan dengan risiko kejadian reaksi transfusi.

**Tujuan:** Untuk mengetahui korelasi antara masa simpan PRC dengan delta IL-1 pada pasien keganasan dewasa pascatransfusi PRC.

**Metode:** Penelitian ini merupakan penelitian *cross sectional*. Subjek penelitian adalah pasien keganasan dewasa di Instalasi Kanker Terpadu “TULIP” RSUP dr Sardjito Yogyakarta yang mendapatkan transfusi 1 kantong PRC dan memenuhi kriteria inklusi. Sampel plasma EDTA diambil dua kali sebanyak 3 mL. Sampel pratransfusi diambil tepat sebelum transfusi dan sampel pascatransfusi diambil dalam dua jam setelah transfusi. Dari sampel tersebut dilakukan pemeriksaan darah lengkap menggunakan alat hematologi otomatis dan pemeriksaan IL-1 menggunakan metode *sandwich* ELISA. Delta IL-1 diukur dari selisih kadar IL-1 pra dan pascatransfusi. Uji korelasi dilakukan antara masa simpan PRC dengan delta kadar IL-1.

**Hasil:** Subjek penelitian berjumlah 32 orang dengan rerata umur subjek adalah  $54,2 \pm 11,3$  tahun. Terdapat peningkatan Hb yang bermakna pascatransfusi ( $p < 0,05$ ) namun tidak demikian halnya dengan parameter angka lekosit dan trombosit ( $p = 0,72$  dan  $0,66$ ). Masa simpan PRC yang digunakan dalam penelitian ini bervariasi antara 1 hingga 9 hari, dengan jumlah terbanyak adalah PRC berumur 2 hari (12 kantong; 37,5%). Tidak terdapat perbedaan bermakna antar kelompok masa simpan PRC berdasarkan volume PRC yang digunakan ( $p = 0,19$ ). Kadar IL-1 mengalami peningkatan dari 1,7 (1,2-23,4) pg/mL pada saat pratransfusi menjadi 2,65 (1,3-24,4) pg/mL pascatransfusi. Median delta IL-1 adalah sebesar 0,75 (1,5-12,8) pg/mL. Masa simpan PRC berkorelasi sedang terhadap delta kadar IL-1 dengan nilai  $r = 0,52$  ( $p < 0,05$ ).

**Simpulan:** Masa simpan PRC berkorelasi sedang dengan delta IL-1 pada pasien keganasan dewasa pascatransfusi PRC.

**Kata Kunci:** Masa simpan PRC, interleukin-1, transfusi PRC, *red cell storage lesion*, anemia pada keganasan.

## ABSTRACT

**Background:** Blood transfusion using a packed red cell (PRC) often required in malignancy patients undergo anemia condition as a result of course of the disease, therapeutic side effect, nutritional deficiency, and also chronic inflammation process. Storage time of PRC have an influence to biochemical and biomechanical changes which known as red cell storage lesion. Proinflammatory cytokines increment which produced by leukocyte in blood product during storage is one of that lesion. Interleukin-1 (IL-1 ) is one of proinflammatory cytokine which can be increased during blood storage. Proinflammatory cytokines are related with risk of transfusion reaction.

**Objectives:** The aim of this study was to measure correlation between storage time of PRC and IL-1 delta in adult malignancy patients after PRC transfusion.

**Method:** This was a cross sectional study. Subject were adult malignancy patients at "TULIP" Integrated Cancer Center of Sardjito Hospital Yogyakarta, who received one bag PRC transfusion and fulfilled inclusion criteria. Three milliliter of plasma EDTA sample were taken twice. First was pretransfusion sample which taken right before transfusion given and the second was posttransfusion sample which taken in two hours after transfusion. Those sample then examined for complete blood count using automatic hematology analyzer and IL-1 level using ELISA sandwich method. Delta IL-1 level was a difference between pre and posttransfusion IL-1 level. Correlation test carried out between storage time of PRC and delta IL-1 level.

**Results:** The research subjects were 32 people with average age  $54.2 \pm 11.3$  years. There were significant increase in hemoglobin after transfusion ( $p < 0.05$ ) but not in leukocyte and thrombocyte count parameter ( $p = 0.72$  and  $0.66$ ). Packed red cell used in this study have a varied storage time between 1 to 9 days, with the most number was PRC have been stored for 2 days (12 bags; 37.5%). There were no significant differences between PRC storage time groups based on volume of PRC used ( $p = 0.19$ ). IL-1 levels increased from 1.7 (1.2-23.4) pg/mL pre transfusion to 2.65 (1.3-24.4) pg/mL post transfusion. The median IL-1 delta was 0.75 (1.5-12.8) pg/mL. Storage time of PRC correlates moderately with IL-1 delta, with  $r$  value 0.52 ( $p < 0.05$ ).

**Conclusion:** Storage time of PRC was moderately correlated with IL-1 delta in adult malignancy patients after PRC transfusion.

**Keywords:** Storage time of PRC, interleukin-1 , PRC transfusion, red cell storage lesion, cancer related anemia.