

## PENGARUH METODE PERSIAPAN DAN STERILISASI *FREEZE-DRIED* *HOMOLOGOUS PLATELET-RICH PLASMA* TERHADAP KADAR *TRANSFORMING GROWTH FACTOR- $\beta$*

### INTISARI

Berdasarkan penelitian *homologous Platelet-rich plasma*(H-PRP) memberikan hasil lebih bagus dari *autologous platelet-rich plasma*(A-PRP) sehingga dilakukan pengembangan untuk terapi ini. Penelitian ini menggunakan H-PRP Palang Merah Indonesia(PMI), produk sisa yang jarang digunakan dan telah lolos screening Infeksi Menular lewat Transfusi Darah (IMLTD). Pembuatan H-PRP di PMI melalui dua metode, sedimentasi(S) dan *single centrifugation*(SC). Sediaan H-PRP di *freeze-drying*(FD) sehingga *growth-factor* yang dikandung tahan lama dan mudah diaplikasikan dalam rongga mulut. Sebelum digunakan, sediaan disterilkan dengan menggunakan radiasi sinar- $\gamma$  dosis 20 dan 25 KGy yang merupakan *golden standart* untuk bahan medis. Transforming growth factor- $\beta$  (TGF- $\beta$ ), *growth factor* terbanyak dalam platelet dan membantu dalam proses *wound healing*. **Tujuan penelitian:** untuk mengetahui pengaruh metode persiapan dan sterilisasi *Freeze-dried homologous platelet-rich plasma* terhadap kadar *transforming growth factor- $\beta$*

Pada penelitian digunakan 40 sampel FD-H-PRP, yang terdiri dari 10 FD-H-PRP metode persiapan (S) diradiasi 20 KGy, 10 FD-H-PRP metode S diradiasi 25 KGy, 10 FD-H-PRP metode SC diradiasi 20 KGy dan 10 FD-H-PRP metode SC diradiasi 25 KGy. Selanjutnya diukur kadar TGF- $\beta$  dengan uji ELISA data dianalisis dengan uji non parametrik.

**Hasil penelitian:** kadar TGF- $\beta$  menunjukkan peningkatan signifikan antara metode (S) dibandingkan (SC) dan terlihat peningkatan kadar TGF- $\beta$  antara dosis 25KGy dibandingkan dengan 20 KGy. **Kesimpulan:** dengan menurunnya *relative centrifugation force* (RVF) akan meningkatkan jumlah platelet dan faktor pertumbuhan yang terkandung, sehingga (S) lebih baik dari (SC) dan semakin besar paparan radiasi sinar- $\gamma$  yang diterima platelet, maka TGF- $\beta$ 1 akan keluar lebih banyak untuk melindungi sel dari kerusakan DNA sehingga kadar dosis 25 KGy lebih tinggi dari 20 KGy

**Kata kunci :** *Sedimentation, single centrifugation, Freeze-Dried Homologous PRP, radiasi sinar- $\gamma$ , TGF- $\beta$ ,*

***EFFECT OF FREEZE-DRIED HOMOLOGOUS PLATELET-RICH PLASMA  
PREPARATION AND STERILIZATION METHODS ON LEVELS  
TRANSFORMING GROWTH FACTOR- $\beta$***

***ABSTRACT***

Research on homologous Platelet-rich plasma (H-PRP) gives better results than autologous platelet-rich plasma (A-PRP) to develop this therapy. This study used H-PRP Indonesian Red Cross (PMI), a leftover product rarely used and has passed the screening for transfusion-transmitted infection(TTI). The production of H-PRP at PMI uses two methods, sedimentation (S) and single centrifugation (SC). The H-PRP preparation is freeze-drying (FD) so that the growth factor it contains is durable and easy to apply in the oral cavity. Before use, the FD-H-PRP sterilized by gamma irradiation at doses of 20 and 25 KGy is the golden standards for medical materials. Transforming growth factor- $\beta$  (TGF- $\beta$ ), the most significant growth factor in platelets and helps in the wound healing process. **Aim:** To determine the effect of Freeze-dried homologous platelet-rich plasma preparation and sterilization methods on levels of transforming growth factor- $\beta$

In this study, 40 samples of FD-H-PRP were used, consisting of 10 FD-H-PRP (S) was given 20KGy irradiation dose, 10 FD-H-PRPS given 25KGy irradiation, 10 FD-H- PRP SC was given 20KGy irradiation, and 10 FD-H-PRP SC was given 25KGy irradiation. Furthermore, the TGF- $\beta$  level was measured using the ELISA test. The data were analyzed using the non-parametric test.

**Results:** TGF- $\beta$  levels showed a significant increase between methods (S) versus (SC), and an increase in TGF- $\beta$  levels between doses of 25KGy compared to 20 KGy was seen. **Conclusion:** decreasing the relative centrifugation force (RVF) will increase the number of platelets, and the growth factors contained, so that (S) is better than (SC) and the greater the-ray radiation exposure received by the platelets, the more TGF- $\beta$ 1 will come out. to protect cells from DNA damage so that the dose level of 25 KGy is higher than 20 KGy

**Keywords:** *Sedimentation, single centrifugation, FD-H-PRP,  $\gamma$ -irradiation, TGF- $\beta$ .*