

## Effect of $\gamma$ -Irradiation Sterilization Dose Towards Transforming Growth Factor- $\beta$ Level on Freeze-dried Homologous Platelet-Rich Plasma

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### ABSTRACT

Currently, Periodontal therapy from Platelet-Rich Plasma (PRP) using blood from the patient himself, the source of each individual is different, resulting in varying growth factor bioactivity, so homologous PRP (H-PRP) developed. Some patients have abnormalities or lack of platelet function, so the results not optimal. Making PRP is complex and lengthy, challenging to use during emergencies and short shelf life. The development of H-PRP using the Freeze-dried PRP (FD-PRP) method can shorten the process, retain longer storage time and maintain growth factor levels equivalent to fresh PRP. Before using it to human, sterilization needed,  $\gamma$ -irradiation sterilization is terminal sterilization used on tissue that has been FD. The purpose of this study was to determine the effect of  $\gamma$ -irradiation doses on the levels of transforming growth factor- $\beta$  on freeze-dried homologous platelet-rich plasma sterilization.

This study 60 samples of FD-H-PRP from Palang Merah Indonesia used with O blood type, divided into 6 groups and given varies dose of  $\gamma$ -irradiation (cobalt-60) 0,5,10,15, 20, 25 KGy for sterilization then the levels of TGF- $\beta$  being measured using ELISA test

Results showed that TGF- $\beta$  levels experienced a significant difference with increasing  $\gamma$ -irradiation doses. It's due to the nature of TGF- $\beta$  which modulates cell survival and has resistance to high-dose radiation also protecting cells from DNA damage due to  $\gamma$ -irradiation on freeze-dried homologous platelet-rich plasma sterilization and the best doses in this research is 20-25 KGy.

**Keywords:** *Freeze-dried homologous PRP,  $\gamma$ -irradiation, TGF-  $\beta$ , Sterilization dose.*