

ABSTRACT

**EFFECTIVITY OF ERYTHROPOIETIN ALFA COMPARED TO
ERYTHROPOIETIN BETA IN PATIENTS
WITH CHRONIC KIDNEY DISEASE-ANEMIA ON HEMODIALYSIS
(Study in Hemodialysis Unit of Bhayangkara Tk. II
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Anemia in patient with chronic kidney disease could cause a lot of complication. The first line therapy of this condition is treat with erythropoiesis-stimulating agents (ESA) or called erythropoietin. The erythropoietin alfa either beta was two types of the human recombinant erythropoietin that usually used in Indonesia. Based on the structure, the glycans from the eritropoietin beta dominated by larger *tetra-acidic glycans* by 46% than eritropoietin alfa (19%). This oligosaccharide structure was bigger and more acidic on eritropoietin beta than eritropoietin alfa. Others differences of this both eritropoietins was bigger bioactivity ratio in vivo : in vitro for eritropoietin beta than eritropoietin alfa.

The aim of this study is to determine the effectivity of erythropoietin alfa compared to erythropoietin beta especially in haemoglobin and haematocrit level. This prospective observational study was conducted in March – September 2016. The patient was all were diagnosed with CKD stage 5 with a minimum of 3 months of regular hemodialysis, Hb <10 g / dL with enough iron status ST > 20% and FS > 200ng / mL, men and women, and has signed the informed concent. This study has been approved by the Health Research Ethics Committee of the RS Bhayangkara H.S. Samsoueri Mertojoso Surabaya. Patients got 2000 IU subcutaneous erythropoietin twice a week on both groups. Blood sample was withdrawn in pre-treatment and after 4 weeks of erythropoietin therapy post-treatment for measurement of haemoglobin and haematocrit. Target for this erythropoietin therapy are increase of Hb 0.5 – 1.5 g/dL (not to exceed 12 g/dL) and increase of Hct level 2 – 4 % in 4 weeks.

Based on the inclusion criteria, there were 20 patients in this study (10 patient each of both erythropoietin alfa either beta group) that consist of 7 women and 13 men. After the treatment, the mean of increased haemoglobin level for eritropoietin alfa group was 1.28 ± 0.80 g/dL ($p=0.001$) and eritropoietin beta was 0.37 ± 0.95 g/dL ($p=0.254$). The mean of increased haematocrit level for eritropoietin alfa group was 3.56 ± 3.46 % ($p=0.010$) and eritropoietin beta was 1.34 ± 2.71 % ($p=0.152$). From the measurement of Haemoglobin and Haematocrit pre and post treatment of both groups showed that there was diffences between the evaluation of increased Haemoglobin parameter (better in eritropoietin alfa) $p = 0.033$, but neither differences in both groups on changes of Haematocrit ($p = 0.127$).

Keywords: Erythropoietin, Alfa, Beta, Chronic Kidney Disease, Haemoglobin, Haematocrit, Ferritin, ST