

Tesis

**KORELASI *RETICULOCYTE HEMOGLOBIN EQUIVALENT*
DENGAN SATURASI TRANSFERIN DAN FERITIN
PADA ANEMIA PENYAKIT GINJAL KRONIS**



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ABSTRAK

Latar Belakang: Anemia merupakan penyulit yang sering terjadi pada pasien PGK. Sekitar 15% anemia PGK disebabkan karena defisiensi besi. Feritin merupakan petunjuk kadar cadangan besi dalam tubuh. Saturasi transferin digunakan untuk mengetahui kadar besi yang tersedia untuk eritropoiesis yang merupakan persentase besi serum dengan jumlah transferin di sirkulasi. *Reticulocyte hemoglobin equivalent* memperlihatkan nilai rerata distribusi kandungan hemoglobin di dalam retikulosit yang menggambarkan ketersediaan besi dalam eritropoiesis. *Reticulocyte hemoglobin equivalent* merupakan parameter stabil yang tidak dipengaruhi inflamasi. Penelitian ini bertujuan untuk mengetahui korelasi antara Ret-He dengan saturasi transferin dan feritin pada anemia PGK.

Metode: Penelitian analitik dengan rancangan potong lintang dilakukan terhadap 46 pasien penyakit ginjal kronis mulai Mei 2021 hingga November 2021. Pemeriksaan Ret-He menggunakan metode *flowcytometry*. Pemeriksaan besi serum dan TIBC menggunakan metode guanine/ferrozine. Saturasi transferin = besi serum/TIBC x 100%. Pemeriksaan feritin menggunakan metode ELFA. Data dianalisis dengan uji korelasi Spearman.

Hasil: Rerata usia subjek penelitian 49,09 (12,39) tahun. Subjek penelitian terbanyak adalah laki-laki yaitu 27 (58,7). Rerata kadar hemoglobin adalah 8,6 (1,72) g/dL dan sebagian besar merupakan PGK stadium 5 (56,5). Nilai rerata Ret-He yaitu 27,63 (4,22) pg, nilai median saturasi transferin 20,46% dan kadar median feritin yaitu 1.200 ng/mL. Sensitivitas dan spesifisitas Ret-He untuk menentukan status besi fungsional adalah 87,50% dan 57,14%. Tidak terdapat korelasi antara Ret-He dengan saturasi transferin ($r=0,111$; $p=0,464$), sedangkan Ret-He dan feritin terdapat korelasi positif lemah ($r=0,291$; $p=0,049$).

Simpulan: Penelitian ini memperlihatkan tidak terdapat korelasi antara Ret-He dengan saturasi transferin pada anemia PGK. Terdapat korelasi antara Ret-He dengan feritin pada anemia PGK dengan kekuatan korelasi lemah.

Kata Kunci: *reticulocyte hemoglobin equivalent*, saturasi transferin, feritin, anemia penyakit ginjal kronik

CORRELATION OF HEMOGLOBIN EQUIVALENT RETICULOCYTE WITH TRANSFERRIN AND FERRITIN SATURATION IN ANEMIA OF CHRONIC KIDNEY DISEASE

ABSTRACT

Background: Anemia is a complication that often occurs in patients with chronic kidney disease (CKD). About 15% of CKD anemia is caused by iron deficiency. Ferritin is an indicator of the level of iron stores in the body. Transferrin saturation is used to determine the level of iron available for erythropoiesis which is the percentage of serum iron by the amount of transferrin in the circulation. Reticulocyte hemoglobin equivalent (Ret-He) shows the average value of the distribution of hemoglobin content in reticulocytes which describes the availability of iron in erythropoiesis. Reticulocyte hemoglobin equivalent is a stable parameter that is not affected by inflammation. This study aims to determine the correlation between Ret-He and transferrin and ferritin saturation in CKD anemia.

Methods: An analytical study with a cross-sectional design was conducted on 46 patients with chronic kidney disease from May 2021 to November 2021. Ret-He examination used flowcytometry method. Examination of serum iron and total iron binding capacity (TIBC) using the guanine/ferrozine method. Transferrin saturation = serum iron/TIBC x 100%. Examination of ferritin using the ELFA method. Data were analyzed by Spearman correlation test.

Results: The mean age of the research subjects was 49.09 (12.39) years. Most of the research subjects were male, namely 27 (58.7). The average hemoglobin level was 8.6 (1.72) g/dL and most of them were stage 5 CKD (56.5). The mean value of Ret-He was 27.63 (4.22) pg, the median value of transferrin saturation was 20.46% and the median level of ferritin was 1,200 ng/mL. The sensitivity and specificity of Ret-He to determine functional iron status were 87.50% and 57.14%, respectively. There was no correlation between Ret-He and transferrin saturation ($r=0.111$; $p=0.464$), while Ret-He and ferritin had a weak positive correlation ($r=0.291$; $p=0.049$).

Conclusion: This study shows that there is no correlation between Ret-He and transferrin saturation in CKD anemia. There is a correlation between Ret-He and ferritin in CKD anemia with weak correlation strength.

Keywords: reticulocyte hemoglobin equivalent, transferrin saturation, ferritin, anemia of chronic kidney disease,