

## Hubungan antara kadar feritin serum dengan kapasitas fungsional pada pasien tetralogi fallot = Association between ferritin serum level and functional capacity in patient with tetralogy of fallot

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### Abstrak

[<b>ABSTRAK</b><br>

Latar Belakang. Kondisi hipoksia kronik pada pasien dengan penyakit jantung bawaan sianotik akan menurunkan oksigenasi jaringan sehingga terjadilah mekanisme adaptasi yaitu eritrositosis sekunder. Besi merupakan substrat yang penting dalam produksi hemoglobin dan cadangan besi untuk menjaga kadar hemoglobin yang adekuat. Namun 50% pasien dengan kelainan penyakit jantung bawaan sianotik mengalami defisiensi besi dan kondisi ini dikaitkan dengan gangguan kapasitas fungsional akibat berkurangnya pengiriman oksigen dan efeknya terhadap metabolisme pada otot rangka. Kadar feritin serum merupakan pemeriksaan yang paling awal dan akurat untuk menilai defisiensi besi. Studi ini bertujuan untuk mengetahui hubungan antara kadar feritin serum dengan kapasitas fungsional pada pasien Tetralogi Fallot (TF).

Metode. Studi potong lintang dilakukan di Departemen Kardiologi dan Kedokteran Vaskular Fakultas Kedokteran Universitas Indonesia/Rumah Sakit Jantung dan Pembuluh Darah Harapan Kita, Jakarta pada pasien TF usia 4-8 tahun yang belum menjalani operasi paliatif dan atau operasi definitif. Dilakukan pengumpulan karakteristik dasar, kadar feritin serum, ekokardiografi, serta uji jalan 6 menit. Dilakukan uji korelasi dan analisis multivariat menggunakan uji regresi.

Hasil. Diteliti sebanyak 20 pasien TF dengan rentang usia 51 hingga 98 bulan. Nilai tengah kadar feritin serum adalah 39.75 g/L (kadar terendah 5g/L, kadar tertinggi 246g/L). Nilai tengah kadar hemoglobin adalah 16.4 g/dL, kadar terendah 12 g/dL dan kadar tertinggi 20 g/dL. Limapuluh persen pasien memiliki kadar feritin serum di bawah normal (< 40 g/L). Pada uji korelasi antara kadar feritin serum dengan jarak uji jalan 6 menit didapatkan nilai  $r = 0.23$  dengan nilai  $p = 0.34$ . Pada uji regresi linear pada 2 kelompok, ditemukan perbedaan rerata jarak uji jalan 6 menit pada kelompok dengan kadar feritin lebih tinggi (> 40 g/L,  $n = 10$ ) sebesar 46,83 m dibandingkan dengan kelompok feritin rendah (< 40 g/L,  $n = 10$ ) dengan koefisien = 46,83; IK 95 -47,81- 141,47  $p = 0,307$ .

Kesimpulan. Secara klinis terdapat kecenderungan pasien TF dengan kadar feritin serum yang lebih tinggi mampu menempuh jarak uji jalan 6 menit yang lebih jauh walaupun secara statistik tidak bermakna.

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<b>ABSTRACT</b><br>

**Background.** Chronic hypoxia in cyanotic congenital heart disease (CCHD) result in reduced of tissue oxygenation, therefore stimulates adaptive mechanism of secondary erythrocytosis. Iron is a vital substrate for hemoglobin production and sufficient iron stores are necessary to achieve and maintain adequate levels of hemoglobin. Unfortunately, 50% of patients with cyanotic CHD are iron-deficient and this condition is associated with exercise intolerance through reduced oxygen delivery and its effect on skeletal muscle cell metabolism Ferritin serum level is the most accurate test to determine iron deficiency. Aim of this study is to evaluate the association between ferritin serum level and functional capacity in patient with Tetralogy of Fallot (TOF).

**Methods.** A cross-sectional study was done in Department Cardiology and Vascular Medicine, Faculty Medicine Universitas Indonesia / National Cardiovascular Center Harapan Kita, Jakarta in patients with TOF aged 4-8 years old before the palliatif and or definite operation. The data collected from patients including basic characteristic, ferritin serum level and erythrocyte index and six minute walk test result. Statistical analysis was done using correlation test and multivariat analysis using regression test.

**Result.** Twenty subjects of TF aged 51 to 98 months was collected. Median level of ferritin serum level was 39.75 g/L (the lowest level 5g/L, the highest level 246g/L). Median level of hemoglobin level was (the lowest level 12 g/dL, the highest level 20 g/dL). Fifty percent of patients had abnormal feritin serum level (< 40 g/dL). There was a correlation coefficient (r) of 0,23 with p value of 0,34 found on the correlation between ferritin serum level and six minute walk test distance. However, on linear regression test between 2 groups of ferritin serum, 46,83 m mean difference of six minute walk test distance found between higher level of ferritin serum group (> 40 g/d, n = 10), and lower level of ferritin serum group (< 40 g/d, n = 10) with = 46,83; IK 95 -47,81- 141,47 p = 0,307.

**Conclusion.** Clinically in patients with higher level of feritin serum there is a tendency able to walk farther on six minute walk test, although statitically not significant.;**Background.** Chronic hypoxia in cyanotic congenital heart disease (CCHD) result in reduced of tissue oxygenation, therefore stimulates adaptive mechanism of secondary erythrocytosis. Iron is a vital substrate for hemoglobin production and sufficient iron stores are necessary to achieve and maintain adequate levels of hemoglobin. Unfortunately, 50% of patients with cyanotic CHD are iron-deficient and this condition is associated with exercise intolerance through reduced oxygen delivery and its effect on skeletal muscle cell metabolism Ferritin serum level is the most accurate test to determine iron deficiency. Aim of this study is to evaluate the association between ferritin serum level and functional capacity in patient with Tetralogy of Fallot (TOF).

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