

## INTISARI

### **Pemeriksaan Spirometri pada Anak Talasemia di Rumah Sakit Sardjito dan Faktor Klinis yang Mempengaruhi**

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**Latar Belakang:** Talasemia adalah penyakit kelainan bawaan autosomal resesif gangguan pembentukan hemoglobin. Indonesia termasuk dalam daerah sabuk talasemia. Beberapa penelitian melaporkan adanya gangguan fungsi paru pada talasemia terutama talasemia beta mayor yang mendapatkan transfusi darah berulang. Gangguan fungsi paru pada anak talasemia belum menjadi perhatian, dikarenakan sering tidak menunjukkan gejala respiratori.

**Tujuan:** Mengetahui angka kejadian gangguan fungsi paru pada anak talasemia serta mengidentifikasi faktor klinis yang mempengaruhinya

**Metode:** Sebanyak 54 anak talasemia beta mayor usia 6-<18 tahun dengan transfusi berulang di rumah sakit Sardjito dari 1 November 2024 sampai dengan 30 April 2025 dilibatkan dalam penelitian, dilakukan pemeriksaan spirometri untuk mengukur nilai *forced vital capacity* (FVC), *forced expiratory volume* 1 (FEV1), FEV1/FVC. Pasien dengan penyakit jantung, paru, dan yang tidak dapat melakukan manuver spirometri dengan baik dieksklusi. Analisis bivariat, multivariat, regresi logistik dilakukan untuk mencari adakah hubungan faktor klinis dengan gangguan fungsi paru.

**Hasil:** Kejadian gangguan fungsi paru dengan menggunakan batas nilai normal spirometri  $\geq 80\%$  nilai prediksi, didapatkan hanya 1 anak (1,9%) dengan gangguan fungsi restriktif ringan, tidak didapatkan gangguan fungsi paru obstruktif maupun campuran. Subanalisis dengan menggunakan batas nilai spirometri  $\geq 90\%$  nilai prediksi menunjukkan 18 anak (33,3%) dengan FVC  $< 90\%$ . Hasil t-test dan Mann-Whitney menunjukkan usia saat diagnosis pada kelompok FVC  $< 90\%$  memiliki median 48 (8-96) bulan, lebih tua dibandingkan dengan kelompok FVC  $\geq 90\%$ . Regresi logistik pada subanalisis hasil spirometri menggunakan batas  $\geq 90\%$  nilai prediksi menunjukkan faktor klinis yang secara bermakna berhubungan dengan lebih rendahnya nilai FVC adalah usia terdiagnosis  $\geq 17,5$  bulan (OR 14,39; 95% CI: 1,242-232,2.  $p=0,046$ ), ferritin serum  $\geq 4962,5$  (OR 12,875; CI: 1,174-155,299.  $p=0,004$ )

**Simpulan:** Gangguan fungsi paru restriktif hanya 1,9%. Faktor klinis yang dapat menjadi prediksi lebih rendahnya fungsi paru adalah usia terdiagnosis  $\geq 17,5$  bulan dan ferritin serum  $\geq 4962,5$

**Kata kunci:** spirometri, talasemia, anak

## ABSTRACT

### **Clinical Factors Affecting Spirometry Examination in Children with Thalassemia in Sardjito Hospital Yogyakarta**

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**Background:** Thalassemia is an autosomal recessive inherited disorder of hemoglobin formation. Indonesia is included in the thalassemia belt area. Several studies have reported impaired lung function in thalassemia, especially beta thalassemia major who receive repeated blood transfusions. Impaired lung function in pediatric thalassemia has not been a concern, because it often does not show respiratory symptoms.

**Objective:** To determine the prevalence of pulmonary dysfunction and identify clinical predictors of early, subclinical lung function decline in children with transfusion-dependent  $\beta$ -thalassemia major.

**Method:** 54 children aged 6 to < 18 years with a diagnosis of transfusion-dependent  $\beta$ -thalassemia major, enrolled between November 2024 and April 2025. Spirometry examination was performed to measure the forced vital capacity (FVC), forced expiratory volume 1 (FEV1), FEV1/FVC. Patients with known comorbid cardiopulmonary disease or who were unable to perform acceptable spirometry were excluded. Analysis bivariate, multivariate, and logistic regression analyses were conducted to find out whether there was a relationship between clinical factors and impaired lung function.

**Results:** Using the normal spirometry value limit  $\geq 80\%$  of predicted value, only 1 child (1.9%) with mild restrictive function disorders, no obstructive or mixed lung function disorders were found. Subanalysis using  $\geq 90\%$  predicted value, 18 children (33.3%) had an FVC < 90%. Independent t-test and Mann-Whitney result showed that median age at diagnosis in children with FVC < 90% is 48 (8-96) month, older than group FVC  $\geq 90\%$ . Using multivariable logistic regression on the subanalysis of spirometry results using the  $\geq 90\%$  predicted value, two factors were found associated with lower FVC values: age at diagnosis  $\geq 17.5$  months (OR 14.39; 95% CI: 1.242-232.2.  $p=0.046$ ), serum ferritin  $\geq 4962.5$  (OR 12.875; CI: 1.174-155.299.  $p=0.004$ )

**Conclusions:** Restrictive lung function disorder was only 1.9%. Clinical factors that could predict lower lung function were age at diagnosis  $\geq 17.5$  months and serum ferritin  $\geq 4962.5$

**Keywords:** spirometry, thalassemia, children or pediatric