

INTERPRETATION OF SPIROMETRY RESULT

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Abstract

Spirometry is a routinely used pulmonary function test that measures the amount and speed of air during inspiration and expiration. The result of spirometry depends on technique and effort during the procedure. The determination of value is based on the standard prediction which is on Indonesian pneumobile project. Spirometry is useful to determine a final diagnosis and to distinguish between obstructive and restrictive disorder. Airway obstructive disorder is a condition characterized by airway limitation to exhale the air maximally. The Obstructive disorder is characterized by decreasing of FEV1/FVC ratio. Obstructive and restrictive disorder (mix) is characterized by decreasing of FEV1/FVC and TLC < 5 percent of prediction normal values. FEF25-75% helps to confirm obstruction disorder in a patient with the low range of FEV1%. A reduction of FEF25-75% of less than 60 percent and low range of FEV1/FVC may confirm airway obstruction. Maximal voluntary ventilation (MVV) is the largest air volume during inspiration and expiration. A low of MVV may occur in obstructive disorder but is more common in restrictive condition.

Keyword: spirometry, obstructive disorder, restrictive disorder

INTERPRETASI HASIL SPIROMETRI

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Abstrak

Spirometri adalah pemeriksaan uji faal paru yang rutin dilakukan untuk mengukur volume dan kecepatan udara pada saat inspirasi dan ekspirasi. Nilai spirometri tergantung dari teknik dan usaha pasien serta pengetahuan pembacaan hasil pemeriksaan oleh dokter. Penentuan besar nilai prediksi berdasarkan nilai standar faal paru *pneumomobile project* Indonesia. Hasil spirometri dapat menegakkan diagnosis serta membedakan antara gangguan obstruksi dan restriksi. Gangguan obstruksi jalan napas merupakan suatu kondisi yang ditandai dengan hambatan aliran udara untuk mengeluarkan ekspirasi secara maksimal. Gangguan obstruksi dinilai dari penurunan nilai rasio VEP1 dan KVP. Gangguan obstruksi dan restriksi (mix) ditandai penurunan nilai rasio VEP1/KVP dan TLC < 5 persentil dari nilai prediksi. Nilai FEF25-75% membantu konfirmasi gangguan obstruksi pada pasien dengan nilai VEP1% pada batas bawah. Penurunan FEF25-75% kurang dari 60% dari nilai prediksi dan VEP1/KVP menunjukkan gangguan obstruksi. *Maximal voluntary ventilation (MVV)* adalah volume udara paru terbesar pada saat inspirasi dan ekspirasi. Nilai MVV yang rendah dapat terjadi pada penyakit obstruksi tetapi lebih sering pada kondisi restriksi.

Kata kunci: spirometri, gangguan obstruksi, gangguan restriksi

ASMA NEUTROFILIK

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Abstrak

Asma merupakan penyakit kronik yang terjadi pada 300 juta penduduk dunia dan akan meningkat menjadi lebih dari 400 juta penduduk di tahun 2020. Penanganan dan pencegahan asma neutrofilik perlu dipikirkan mengingat selama ini penanganan asma lebih banyak difokuskan pada asma yang disebabkan inflamasi eosinofil. Fenotip asma dibagi menjadi asma alergi *early onset*, asma *late onset*, *exercise induced asthma*, asma pada obesitas, dan asma neutrofilik. Neutrofil berperan pada terjadinya asma respons cepat maupun lambat, menarik limfosit T dan sel dendritik ke tempat terjadinya inflamasi. Sel T *helper-2* (Th-2) berperan dalam proses asma eosinofilik sedangkan sel Th-1 dan Th-17 berperan dalam asma neutrofilik. Faktor risiko asma neutrofilik meliputi asma akibat kerja, asma pada obesitas, asma dengan *gastro oesophagal reflux disease* (GERD), dan asma pada perokok. Pemeriksaan biomarker penderita asma neutrofilik dapat dilakukan dengan cara induksi sputum, biopsi jaringan, dan BAL. Terapi antiinflamasi khusus diperlukan pada penanganan asma neutrofilik meliputi antagonis LTB-4, *adhesion molecule blockers*, antagonis kemokin, anafilatoksin antagonis, LABA, teofilin, PDE-4 *inhibitor*, inhibitor molekul p38MAP kinase, PI3Ks *inhibitor*, NF-kB inhibitor, dan antioksidan.

Kata kunci: asma, asma neutrofilik, fenotip asma, terapi antiinflamasi

NEUTROPHILIC ASTHMA

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Abstract

Asthma is a chronic disease that occurs at 300 million people worldwide and will increase to more than 400 million people in 2020. Treatment and prevention of neutrophilic asthma need to think about considering that asthma management more focused on asthma induced eosinophil inflammation. The phenotype of asthma is divided into allergic asthma early onset, late onset asthma, induced-exercise asthma, asthma in obese, and neutrophilic asthma. Neutrophils play a role in the occurrence of asthma response sooner or later, attract T lymphocytes and dendritic cells to the site of inflammation. T cell helper-2 (Th-2) plays a role in the process of eosinophilic asthma while Th-1 and Th-17 plays a role in neutrophilic asthma. Neutrophilic asthma risk factors include occupational asthma, obesity-asthma and asthma with gastro-esophageal reflux disease (GERD), and asthma in smokers. Examination for biomarker in neutrophilic asthma patient can be done by sputum induction, tissue biopsy, and BAL. Special anti-inflammatory therapy is required in neutrophilic asthma management includes LTB-4 antagonist, adhesion molecule blockers, chemokine antagonists, anaphylatoxin antagonist, long-acting beta agonist, theophylline, PDE-4 inhibitor, p38MAP molecule kinase inhibitor, PI3Ks inhibitors, NF-kB inhibitors, and antioxidants.

Keyword: asthma, neutrophilic asthma, phenotype of asthma, anti-inflammatory therapy