

Accuracy of mid expiratory flow and dysanapsis parameters for evaluation of methacholine provocation test

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Abstract

Background: The most sensitive parameter for evaluation of airway hyper-responsiveness is PC_{r50} (50% decrease in specific airway conductance). But assessment of this parameter requires expensive equipments. This study aimed to evaluate mid expiratory flow and dysanapsis parameters in standard spirometry for possible substitution of PC_{r50} . **Materials and Methods:** Thirty-seven subjects with clinical findings suggestive of asthma who had normal standard spirogram were entered in this case-control prospective study. Thirty-seven healthy volunteers were also included in this study as controls. Airway responsiveness was examined by methacholine challenge test and measurement of PC_{r5} and PC_{r15} . In addition, concentration of methacholine needed for 5% reduction in $FEF_{75-75\%}$, $MEF_{50\%}$, and $FEF_{75-75\%}/FVC$ was determined and compared with PC_{r50} as the gold standard. $FEF_{75-75\%}/FVC$ ratio was used for evaluation of dysanapsis. **Results:** PC_{r50} was more sensitive than PC_{r5} and was obtained in 93% (14/15) of patients in both groups. Although PC_{r50} and new parameters could be positive in both groups, the concentrations in two groups were significantly different. Regression model showed that in asthmatic patients all the conventional and new parameters had good and comparable correlations with PC_{r50} . But in the control group alone and in both asthmatic and control groups, PC_{r5} of $FEF_{75-75\%}/FVC$ showed a significant correlation with PC_{r50} . PC_{r5} of $FEF_{75-75\%}/FVC$ was also significantly correlated with PC_{r5} of FEV_1 in asthmatic and control groups. PC_{r5} of $FEF_{75-75\%}/FVC$ and $MEF_{50\%}$ revealed the best accuracy. An equation was determined for calculation of PC_{r50} according to PC_{r5} of $FEF_{75-75\%}/FVC$ and $MEF_{50\%}$ when PC_{r50} was unavailable. **Conclusion:** PC_{r5} of $FEF_{75-75\%}/FVC$ ratio and $MEF_{50\%}$ are sensitive parameters for diagnosis of airway responsiveness. PC_{r5} of $FEF_{75-75\%}/FVC$ is the best substitution for PC_{r50} . ©2009 NRIITLD, National Research Institute of Tuberculosis and Lung Disease.

Reaxys Database Information

Author keywords

Airway responsiveness; Asthma; Dysanapsis; Methacholine; Provocation test

Indexed Keywords

EMTREE drug terms: methacholine

EMTREE medical terms: accuracy; adult; airway dynamics; airway responsiveness; article; asthma; clinical article; controlled study; expiratory flow; human; lung parenchyma; mid expiratory flow; parameter; provocation test; spirometry

Chemicals and CAS Registry Numbers: methacholine, 55-92-0

ISSN: 1730-0344 **Source Type:** Journal **Original language:** English

Document Type: Article