Letter to the Editors
Allergy Asthma Immunol Res. 2016 January;8(1):84-85.
http://dx.doi.org/10.4168/aair.2016.8.1.84
pISSN 2092-7355 • eISSN 2092-7363

AAIR
Allergy, Asthma & Immunology Research

Inflammation Markers and FEF_{25-75}: A Relevant Link in Children With Asthma

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Jang and colleagues investigated the relationship between exhaled nitric oxide (FeNO) and atopy profiles in children with asthma.[1] They focused their attention mainly on the FeNO, showing that this parameter varied according to the profile of atopy. The authors also investigated lung function, including bronchial hyperreactivity. However, forced vital capacity, forced expiratory volume in 1 second (FEV1), and their ratio were considered as parameters for lung function test. On the other hand, great attention has been recently paid to the relevance in asthma pathogenesis of FEF_{25-75} values,[2] a parameter considered to better reflect small airways than the gold standard parameters of airway obstruction, such as forced vital capacity and FEV1.[2] This may be even more relevant in childhood.[3] Indeed, in allergic children with asthma, impaired FEF_{25-75} values appear to be related to severe bronchial hyperreactivity,[4] reversible airway obstruction[5]; perception of breathlessness and of positive response to reversibility test, assessed by visual analogue scale.[6,7]

Since impaired FEF_{25-75} values were reported to be significantly associated also with the presence of high fractional FeNO levels in children with allergic rhinitis and/or asthma,[8] it is possible that this marker of small airway obstruction could be related also to the degree of allergic sensitization (and of systemic allergic inflammation).

Previously, it has been reported that children with asthma due to mite allergy showed a tightly link between allergen-specific serum IgE and markers of allergic inflammation, such as eosinophil and FeNO, but no correlations were detected with bronchial obstruction, expressed as FEV1 values.[9] On the basis of these considerations, we evaluated a cohort of children with allergic asthma, sensitized to house dust mites, aiming at investigating possible relationship between lung function, mainly concerning FEF_{25-75}, and inflammation parameters, such as blood eosinophilia, allergen-specific serum IgE, and FeNO. Fifty-six children, 5 to 12 years of age, were studied. Blood eosinophil number inversely and moderately related with FEF_{25-75} values ($r=-0.52$; $P<0.0001$), as reported in Figure A. Also the relative blood eosinophil numbers, expressed as percentage on total blood leukocytes count, significantly and negatively correlated with FEF_{25-75} values ($r=-0.4$; $P=0.001$) (Figure B). Serum levels of house dust mites specific IgE showed negative significant correlations with FEF_{25-75} values ($r=-0.31$; $P=0.01$), as reported in Figure C. Finally, a significant negative relationship was demonstrated between FeNO and FEF_{25-75} values ($r=-0.33$; $P=0.01$) (Figure D). In contrast, a significant negative correlation with FEV1 values was detected only for blood eosinophil numbers ($r=-0.35$; $P=0.006$). These findings further confirm the possibility to detect links between markers of allergic inflammation and airflow limitation and further support the importance of FEF_{25-75} assessment in the evaluation of childhood allergic asthma.

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Received: July 12, 2013; Accepted: July 19, 2013
• There are no financial or other issues that might lead to conflict of interest.

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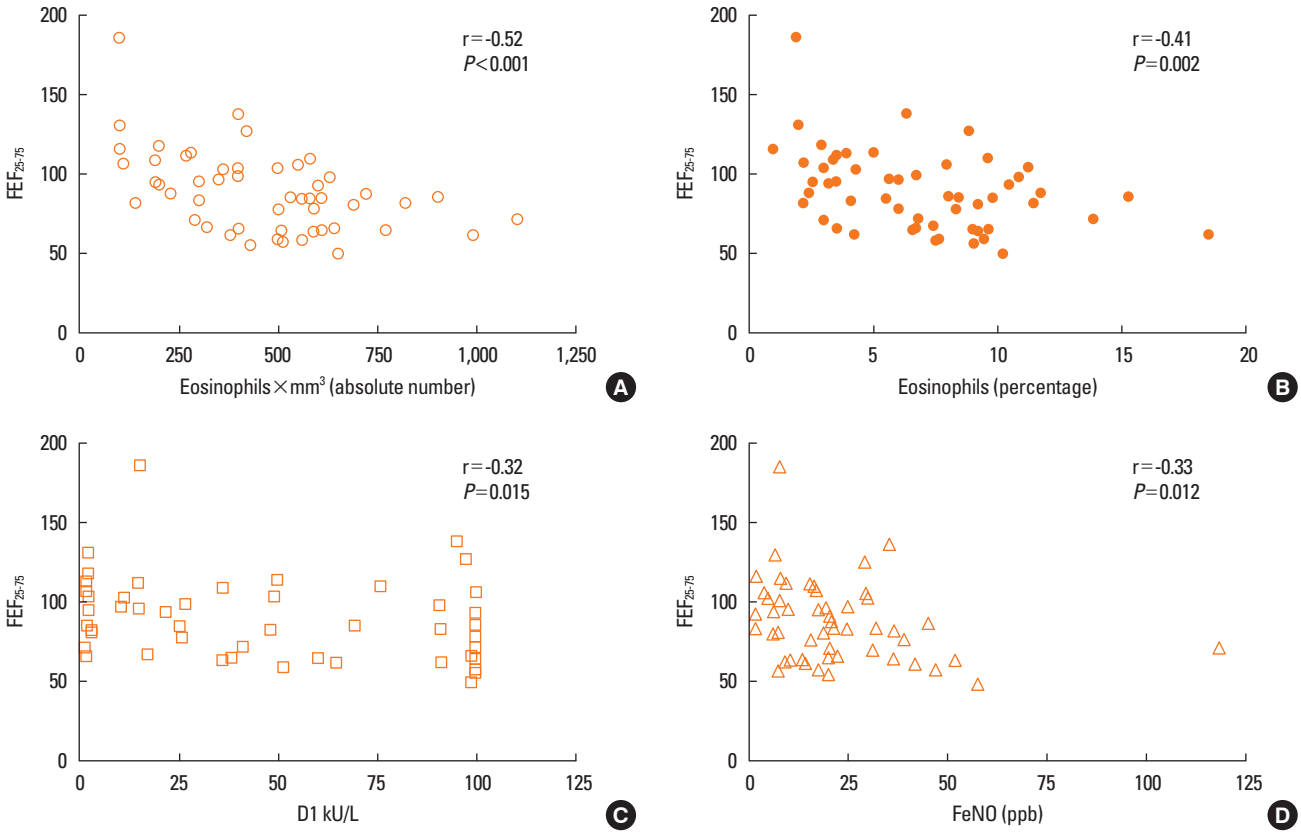

Figure. Relationship between FEF25-75 values and different inflammatory/allergy markers: blood eosinophils (as absolute number (A), as relative number (B), serum IgE to house dust mites (C), and FeNO (D).

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