

# Pulmonary function characteristics in children with suspected asthma: implications for asthma diagnosis

Mireu Park<sup>1</sup>, Yun Young Roh<sup>1</sup>, Ha Min Kim<sup>1</sup>, Jae Hwa Jung<sup>1</sup>, Soo Yeon Kim<sup>1</sup>, Jong Deok Kim<sup>1</sup>, Yong Ju Lee<sup>2</sup>, Min Jung Kim<sup>2</sup>, Yoon Hee Kim<sup>3</sup>, Kyung Won Kim<sup>1</sup>, and Myung Hyun Sohn<sup>1</sup>

<sup>1</sup>Severance Hospital, Institute of Allergy, Institute for Immunology and Immunological Disease, Brain Korea 21 PLUS Project for Medical Science, Yonsei University College of Medicine

<sup>2</sup>Yongin Severance Hospital, Institute of Allergy, Institute for Immunology and Immunological Disease, Brain Korea 21 PLUS Project for Medical Science, Yonsei University College of Medicine

<sup>3</sup>Gangnam Severance Hospital, Institute of Allergy, Institute for Immunology and Immunological Disease, Brain Korea 21 PLUS Project for Medical Science, Yonsei University College of Medicine

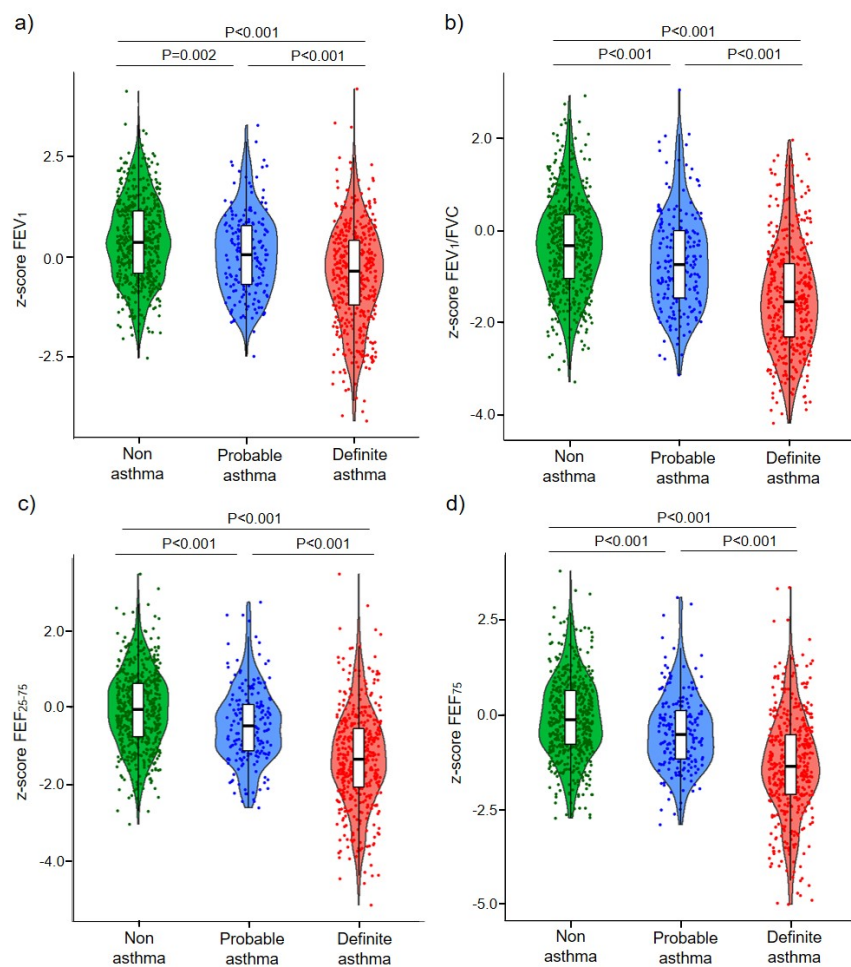
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## Abstract

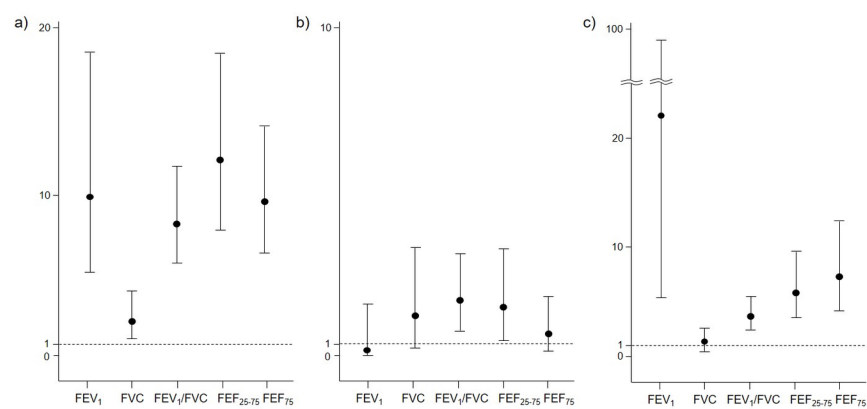
**Background:** In children suspected of asthma, diagnosis is confirmed via variable expiratory airflow limitation. This study aimed to evaluate the pulmonary function characteristics in children suspected of asthma without bronchodilator response (BDR) and bronchial hyperresponsiveness (BHR). **Method:** We utilised two separate retrospective observational cohorts of children who underwent spirometry and bronchial provocation testing for asthma. Spirometry parameters were collected and compared between definite asthma, probable asthma, and non-asthma groups. The original cohort comprised 1199 children who visited the Severance Hospital (Seoul, Korea) between January 2017 and December 2019. The external cohort included 105 children who visited the Gangnam Severance Hospital between January 2000 and December 2017. **Result:** Probable asthma accounted for 16.8% and 32.4% of the original and external cohorts, respectively. Baseline forced expiratory volume in 1 second (FEV1), FEV1/forced vital capacity (FVC), forced expiratory flow at 25-75% of FVC (FEF25-75), and FEF75 showed stepwise decrements from non-asthma, probable asthma, to definite asthma patients ( $P < 0.001$ ). The probable asthma group showed significantly higher odds of abnormal FEV1/FVC (OR, 2.24 [95%CI, 1.43-3.52]) and FEF25-75 (OR, 2.05 [95%CI, 1.13-3.73]) than the non-asthma group and lower odds of abnormal FEV1 (OR, 0.05 [95%CI, 0.01-0.19]), FEV1/FVC (OR, 0.27 [95% CI, 0.18-0.41]), FEF25-75 (OR, 0.17 [95%CI, 0.11-0.28]), and FEF75 (OR, 0.14 [95%CI, 0.08-0.24]) compared to the definite asthma group. The external cohort was consistent with the original cohort. **Conclusion:** We show evidence of airway dysfunction in children for whom a high clinical suspicion of asthma exists without evidence of BDR and BHR.

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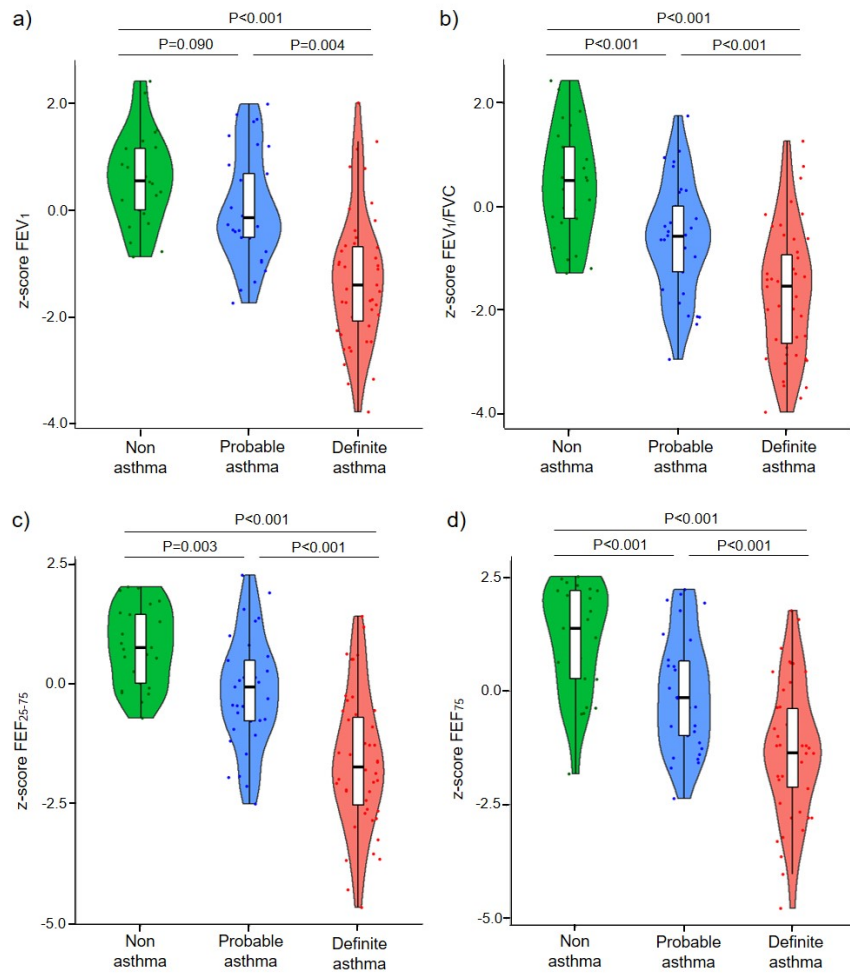
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**Figure 1**



**Figure 2**



**Figure 3**