

European Respiratory Society Annual Congress 2012

Abstract Number: 397

Publication Number: P312

Abstract Group: 5.2. Monitoring Airway Disease

Keyword 1: Asthma - diagnosis **Keyword 2:** Adolescents **Keyword 3:** Biomarkers

Title: Ethnic difference and diagnostic value of exhaled nitric oxide levels for predicting asthma in children

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Body: Exhaled nitric oxide (eNO) has been use as non-invasive marker of airway inflammation but normal reference data in children are limited. Levels of eNO in a random sample of 1099 Chinese children aged 11-18 years recruited from Hong Kong were measured online by a chemiluminescence analyzer according to ERS/ATS standard. Each student also completed an ISAAC questionnaire. Children who had never been diagnosed to have asthma and did not have any symptoms of wheeze, rhinitis or eczema were considered as normal controls. Ninety-four steroid naïve asthmatics were recruited from the Asthma Clinic for eNO measurement for comparison. Among the control children, there were 369 boys and 373 girls. In control children, the eNO levels (median, interquantile range) were significantly higher ($P<0.001$) in males (11.4 ppb; 7.7-21.6) than in females (9.0 ppb; 5.9-13.4). For asthmatic males, the median eNO (interquartile range) was 45.5 ppb (28.3-74.1); for asthmatic females, 47.2 (28.8-69.5). Using a cutoff of 15 ppb for girls, the sensitivity and specificity for differentiating asthma from controls are 86% and 78% (AUC of ROC curve =0.89); for boys, the sensitivity and specificity are 80.4% and 79.4% using a cutoff of 25 ppb (AUC of ROC curve = 0.84). This is one of the largest studies of eNO in children and demonstrates a gender difference of eNO levels in Chinese schoolchildren and their levels are higher than the reported values for Caucasians. Different cutoff vales for boys and girls are needed when eNO is used for supporting the diagnosis of asthma in children.Supported by HKRGC CUHK4512/06M and CUHK 477110.