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The Relationship between Fractional exhaled nitric oxide (FeNO) and Asthma Control and Asthma Severity in Asthmatic Adults in Vietnam

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Abstract

Background: FeNO has been used as a marker for airway inflammation, although controversy persists on its clinical utility in asthma management. The relationship between FeNO levels, asthma control plus asthma severity in Vietnamese patients has not previously been reported.

Methods: Cross-sectional study conducted in asthmatic patients ≥ 18 years old in Ho Chi Minh City, from 3/2015-3/2017. Asthma control and severity were assessed using GINA 2017 criteria, and the relationship with FeNO (Niox Mino) was assessed. FeNO cut-offs predicting asthma control status were determined using receiver operating characteristic (ROC) curve analysis.

Results: 278 asthmatic patients with 68% female and mean age 44 years, mean asthma duration 10 years. Mean (SD) FeNO was 30.6 (24) parts per billion (ppb). Patients with uncontrolled (16%), partly-controlled (29%) and well-controlled asthma (55%) had mean (SD) FeNO was 56 (40), 26.4 (16) and 25.7 (17) ppb, respectively, and these means were significantly different ($p < 0.001$). Patients with mild (12%), moderate (17%) and severe asthma (45%) had mean (SD) FeNO was 23.1 (17), 31.1 (25) and 29.2. (23) ppb, respectively and these means were not significantly different ($p = 0.3$). The area under the ROC curve (AUC) for the FeNO predicting uncontrolled asthma was 0.730 (95% CI: 0.637-0.823) with optimal cut-off point of FeNO > 50 ppb. The AUC for detecting well-controlled asthma was 0.601 (95% CI: 0.534-0.668) with optimal cut-off point of FeNO < 25 ppb.

Conclusions: FeNO level was not related to GINA defined asthma severity but statistically related to asthma control status and can predict uncontrolled and well-controlled asthma.