European Respiratory Society
Annual Congress 2012

Title: A simple practical method to partition lung peripheral and airway nitric oxide

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Body: Background: By measuring FeNO at multiple flows and applying mathematical models of FeNO exchange dynamics, the signal can be partitioned into its proximal airway [Jno (nl/sec)] and distal airway/alveolar contributions [Calv (ppb)] using a linear regression. This method is time consuming, requires at least 3 exhalations and is affected by a number of limitations such as axial diffusion and turbulent flow. We developed a more practical method. Methods: In a group of 29 normal subjects (38±2 yr; 20 male), 13 asthmatic patients (48±8 yr; 8 male, FEV1 90±4 % predicted), 14 patients with chronic obstructive pulmonary disease (COPD) (63±2 yr; 10 male, FEV1 59±3 %), and 12 patients with cystic fibrosis (21±4 yr; 8 male, FEV1 60±3 %) we compared Calv and Jno with the variation of total NO production at 50 and 200 ml/s [Vno50-200 (nl/s)]. Vno was measured by calculating the average area under the curve (NO concentration/time) of two successive exhalations at each flow rate. Results: Vno50-200 was strongly correlated with Jno in normal subjects (r=0.94, p<0.001), asthma (r=0.98, p<0.001), COPD r=0.93, p<0.001), and CF patients (r=0.74, p<0.05). This agreement was confirmed by the Bland and Altman test. Conclusions: The flow dependent component of exhaled NO is determined by its bronchial production which can be estimated by measuring Vno50-200. This method is simple, does not require sophisticated equipment or mathematical models and is in agreement with Jno calculated mathematically with the conventional linear regression method.