Gender and Exhaled Nitric Oxide

To the Editor:

We read with interest the article by Olin et al1 (November 2006) on the influence of height, age, and atopy on exhaled nitric oxide (FENO) in a large, adult, general population sample. In the results, the authors2 state that gender was not associated with FENO. We think that this statement needs a comment. Evaluating data in the univariate analysis, FENO levels were higher in men than in women: median value (25th to 75th percentile), 15.8 parts per billion (ppb) [11.7 to 21.5] in women, vs 18.8 ppb (13.7 to 25.5) in men (p < 0.05). In a multiple linear regression model, the authors found no association with gender, whereas FENO was independently and positively associated with atopy, height, age, smoking, asthma symptoms in the last month, and reported use of inhaled steroids.1

We have recently published an article2 in which, when measuring FENO in 204 healthy, nonsmoking, nonatopic adults with normal spirometry values using the American Thoracic Society/European Respiratory Society recommendations, a significant difference (p < 0.01) in FENO values comparing men and women was documented. The possible explanations of the results found by Olin et al could be the major effect of the other different independent variables on FENO compared with gender. It is well known that smoking and inhaled steroids dramatically reduce, whereas atopy and asthma symptoms significantly increase levels of FENO.4 We agree that the influence of atopy, smoke, asthma symptoms, and steroids on FENO values is more relevant than gender; however, we believe that FENO reference values based on gender should be considered in the management of asthma in order to obtain the best possible clinical control with the lowest inhaled steroids administration.5

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Exhaled Nitric Oxide and Gender

To the Editor:

We are grateful for the comments by Dr. Olivieri and colleagues regarding one of our recent publications in CHEST (November 2006).1 Their message is that reference values for exhaled nitric oxide should be based on gender. However, we cannot find any support for that opinion in the data from our general population studies.1,2

One of the key messages in our first article was that gender was not related to exhaled nitric oxide when other factors were taken into account.1 These results were based on multiple regression modeling, a technique that usually is applied when there are a lot of factors influencing the outcome. The results of our univariate analyses showed an association between gender and exhaled nitric oxide; however, those results are of limited value because they may be biased by other factors, such as height, that influence exhaled nitric oxide levels. We have extended our analyses and recently published reference values of exhaled nitric oxide among lifelong never-smokers excluding all subjects with asthma and asthma symptoms,2 and found that exhaled nitric oxide was not related to gender in that sample.

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1 Olin AC, Rosengren A, Thelle DS, et al. Height, age, and atopy are associated with fraction of exhaled nitric oxide in a large adult general population sample. Chest 2006; 130:1319–1325