International Journal of COPD

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LETTER

Is exposure to biomass smoke really associated with COPD?

This article was published in the following Dove Press journal:
International Journal of COPD
17 February 2017
Number of times this article has been viewed

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Dear editor

We read the article by Balcan et al[1] with great interest. The authors have reported a case–control study that included 115 females and looked at the association between exposure to biomass smoke and detection of COPD. Although the authors concluded a positive association, we are concerned about the issues related to the conduct of the study and discrepancies in the data reported. COPD cases in this study were defined based on pre-bronchodilator forced expiratory volume in 1 second/forced vital capacity (FEV_1/FVC) ratio <0.70. However, the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines define COPD based on post-bronchodilator FEV_1/FVC ratio <0.70. Hence, many subjects detected to have COPD in this study may actually have had asthma, in which case, the findings of the study would not apply to the COPD population. Also the overall population included in the study was relatively younger (18–48 years). Use of a fixed ratio of FEV_1/FVC is likely to lead to underdiagnosis of airflow limitation in this age group.[2] Use of lower limits of normal would have been a better approach. Also, COPD is more common in age groups above 40 years. Therefore, we are not convinced about the selection of population with younger age.

The case definition was based entirely on spirometry which is susceptible to errors. Interpretation from 3 acceptable and 2 repeatable graphs ensures good-quality measurements. However, the authors did not report how the quality of spirometry was ensured and how many participants performed good-quality spirometry.[3] It is difficult to believe that all 100% of the study participants performed good-quality spirometry.

The authors defined small airway disease as forced expiratory flow 25%–75% ($FEF_{25\%–75\%}$) <60% predicted. However, the values of $FEF_{25\%–75\%}$ are also reduced in subjects with lower FVC. Hence, use of the ratio of $FEF_{25\%–75\%}$ to FVC corrects for the effect of reduced FVC and provides more reliable information.[4] Considering 20 cases with reduced FVC suggests significant confounding of the association with small airways disease due to reduced FVC.

We would also like to highlight the issues related to the statistical tests used and data reported. The authors have reported lung function data in median and inter-quartile range. The visual impression of Figure 3 suggests that the data were not normally distributed. However, the authors have compared the two groups (cases and controls) using the parametric *t*-test. A non-parametric test in this instance would have been more appropriate. The numbers reported in different tables did not match with each other. For example, the authors report 27 participants as having small airways disease in Table 3, whereas they report 17 participants as having small airways disease in Table 5. Also in Table 5 the authors have reported that 115 participants (95 without

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Dovepress
http://dx.doi.org/10.2147/COPD.S127466

restriction and 20 with restriction) had $FEV_1/FVC > 70\%$ suggesting that no one had reduced ratio, which emphasizes that no one in the study group had COPD.

In view of the above limitations, we wish to alert the readers of the journal to interpret the results of this study cautiously.

Disclosure

The authors report no conflicts of interest in this communication.

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Authors' reply

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Dear editor

According to GOLD guidelines, post-bronchodilator pulmonary function test results are taken into account to diagnose COPD. As this is a standard criterion according to GOLD, we did not mention it in the methodology section, though we used post-bronchodilator results. Moreover, it is known that in a standard spirometry test, the best of three attempts should be taken into consideration; therefore, we did not mention that the best of three attempts was taken.

In addition we excluded allergic diseases such as asthma based on both the spirometry results and the past medical history of patients (patients who were diagnosed with asthma and allergic rhinitis were also excluded).

This study was performed in a territory that has poor environmental setting and technical supports. We evaluated the patients using simple pulmonary function tests. Advanced tests such as radiological imaging with chest X-ray or computed tomography should have been performed to attain accuracy, but we were lacking these types of supports.

Disclosure

The authors report no conflicts of interest in this communication.