COPD, smoking behaviour, and the importance of teachers as role-models for adolescents

BPCO, tabagismo e l'importanza degli insegnanti come modello per gli adolescenti

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Chronic obstructive pulmonary disease (COPD) has been described by the ATS (American Thoracic Society)/ERS (European Respiratory Society) guidelines [1] as a disease "characterized by airflow limitation that is not fully reversible". The diagnosis of COPD should be considered in any patient who experiences cough, sputum production, or dyspnea in association with specific risk factors, which for the vast majority is cigarette smoking [2,3]. COPD has long been acknowledged as a major cause of respiratory disability, but the magnitude of its impact has been only recently recognized. According to the World Health Organization, COPD will reach the 3rd rank as cause of mortality [4] and 7th rank as cause of disability by 2030 worldwide [5]. COPD represents a huge burden for the healthcare systems and causes increasing costs to society due to absence from work, visits to the doctor's clinic, medication, and hospital admissions. The socio-economic burden from COPD is also expected to increase.

Recently, the Burden of Obstructive Lung Disease (BOLD) Initiative measured the prevalence of COPD and its risk factors in 12 cities all over the world. Prevalence rates of GOLD-defined COPD stage II or higher (i.e. forced expiratory volume in one second (FEV_1)/forced vital capacity (FVC) < 0.70 and FEV_1 < 80% predicted) were 10.1% overall, 11.8% for men and 8.5% for women with age > 40 years [6].

Within the Northern Ireland Cost and Epidemiology of Chronic Obstructive Pulmonary Disease (NICE-COPD) study on a general population sample in the Greater Belfast area, the prevalence of COPD varied from 4.9% (40–49 years) to 12.3% (60–69 years) in men and from 1.4% (40–49 years) to 4.5% (60–69 years) in women [7]. Data collected in a general population sample living in North Italy showed a progressive increase of the prevalence of chronic bronchitis and emphysema with age in both males and females, reaching values of 16% for chronic bronchitis and 7% for emphysema in males aged > 64 years [8]. Moreover, in the general adult population sample living in North Italy, airway obstruction (computed using the GOLD criterion) was present in 18.3%, varying from 9.9% (25-45 years) to 28.7% (> 45 years) [9].

The growing burden of COPD is mainly due to the aging of the world's population and to the continued use of tobacco [10]. Since the majority of smokers start smoking at adolescent age, the influence of society is important at this period, and in particular the school setting (above all teacher behaviour) could be crucial for adolescents' future lifestyle. Unfortunately, the smoking rate of teachers is high and it is thought that also the COPD prevalence could be high in this category. For these reasons, Barış et al. performed a study, reported in the current issue of *Multidisciplinary Respiratory Medicine* (pag. 92-96), to evaluate smoking habit

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and COPD prevalence of teachers working in the schools of Kocaeli City (Turkey). The study was conducted in 660 teachers, with a mean age 38.9 ± 8.9 years, who filled out a questionnaire and performed a pulmonary function test. A high prevalence of smoking habits was found: 44.1% of the teachers were smokers, 17.7% ex-smokers. There was a higher prevalence of smokers and ex-smokers, a longer smoking history and a higher daily mean number of cigarettes smoked in males than in females. As regards the pulmonary function test, 1.7% of the teachers resulted obstructed according to GOLD criteria ($FEV_1/FVC < 70\%$); 18% were females and 82% males. These results highlight not only the high smoking rate, but also an apparently non negligible COPD prevalence in a population of young adults.

Many recent studies, aimed at assessing the COPD prevalence, have focused on subjects older than 40 years, showing high prevalence rates ranging from about 5% to 20% [6,7,11]. The prevalence rate reported by Barış et al. is lower (1.7%), but it refers to younger subjects (with a mean age under 40 years) and with a quite low daily cigarette consumption among smokers (5.7 cigarettes/day). Indeed, this result is similar to the findings of the European Community Respiratory Health Survey, performed in a sample of young adults (20-44 years): 2.0% of the subjects had a FEV_1/FVC ratio less than 70% [12]. In addition, Barış et al. reported a non negligible proportion of teachers with small airways disease (17.7%).

The higher COPD prevalence in males confirms the findings of other authors [7,12]; it could be due to the different smoking pattern of males (higher prevalence of smokers, longer history of smoking, higher number of daily cigarettes) with respect to females; however, it should be noted that recent studies have suggested an increasing risk of COPD in females due to their increasing smoking habits in the last decades [6].

A comment is necessary on the choice of Barış et al. to use the GOLD criterion for the definition of obstructed subjects. This fact could be one of the reasons for the low value of COPD prevalence found in their study; indeed the fixed cut-off of $FEV_1/FVC < 70\%$ can lead to an underestimation of airflow obstruction in younger subjects with respect to the ERS-ATS recommended criterion [11].

This aspect was considered also in the study by de Marco et al. [12], who evaluated the role of symptoms and smoking habits in predicting the main clinical outcomes in subjects with mild/moderate airflow obstruction, computed using the lower limit of normality (LLN) or the GOLD criterion: airflow obstruction at baseline, in smokers and subjects with respiratory symptoms, was associated with a steeper lung function decline and a higher rate of hospitalization for respiratory causes. The results were the same when using the LLN or the GOLD definition. In particular, the GOLD and the LLN were associated with long-term outcomes and had a similar rate of false positives. Neither of them predicted outcomes in non-smokers and asymptomatic subjects with airflow obstruction. Furthermore, the fact that the GOLD criterion identified a smaller number of obstructed young adults (2.0% vs. 6.2%) and was more strongly associated with the two studied outcomes than the LLN criterion highlighted the fact that the former has a higher specificity and a lower sensitivity than the latter and vice versa. In conclusion, the findings reported by Barış et al. highlight the need for educational programs encouraging smoking cessation targeted to this professional group, not only for their personal health protection but also in view of their importance as a role-model for adolescents. Moreover, this study confirms the importance for young smokers of seeking assessment of lung function. The identification of early cases of obstruction, including small airways disease, supports early smoking cessation, the most important action proven to reduce risk of severe outcome of the disease and to identify subjects with a possible worse long-term prognosis.

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