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Lung Diseases in the Elderly

In the present issue of *Respiration*, *Quadrelli and Roncoroni* [1] compare characteristics of asthma between 99 younger patients and 50 elderly asthmatics. Their results suggest that the severity of asthma increases with age and that the increase in severity is related to the duration of the disease rather than to age itself: severity is greater in elderly patients with longer disease duration than in younger patients and elderly subjects with shorter disease duration. As mentioned by the authors, one explanation may be that their patients with long-standing disease did not receive proper anti-inflammatory treatment during most of their asthma history.

Indeed, the apparent increase in the severity of some lung diseases in the elderly may be explained by several factors, i.e., intrinsic changes of the aging respiratory system, environmental exposures (to inhaled pollutants and/or pharmacological agents), and nonrespiratory diseases.

Intrinsic changes of the lung and airways may be classified into structural, functional, and immunological. Structural changes include an increase in the anteroposterior diameter of the lung and an increase in the distance between alveolar walls and in the number of interalveolar communications [2]. Subsequently, there is a decrease in the number of alveoli per unit volume, and focal areas of emphysema may develop, even in lifelong nonsmokers. Concomitant functional changes are a decrease in maximum expiratory flows and transfer factor, a loss in elastic lung recoil, and an increase in closing volume [2]. Finally, immunological changes lead to an impairment in lung defenses, due to decreased neutrophil functions and T cell responses, which explains the increased risk of lower respiratory tract infections and the risk of reactivation of tuberculosis [2]. Besides, mucociliary clearance is also

impaired, which increases the risk of aspiration. A last age-related feature that may be relevant is that spontaneous complaints may be less in the elderly than in younger subjects. Indeed, it has recently been shown that elderly subjects with community-acquired pneumonia describe less symptoms and seek medical attention later than younger subjects [3]. In chronic diseases such as asthma, this may lead to underestimation of the severity of the disease and, subsequently, to undertreatment. Due in part to the above-mentioned normal changes of the aging respiratory system, the way of interpreting pulmonary function tests is an important issue: as *Quadrelli and Roncoroni* did, the usual practice is to express results as percent predicted, 80% predicted being the lower limit of normal. However, as stated a few years ago in European guidelines on lung function testing, the use of this threshold may lead to falsely consider as abnormal values which are in fact within the 95% confidence interval of the absolute values of the reference population [4]. Thus, it should be advised to use standardized residuals rather than the usual percent predicted to express the results of lung function tests, especially when age increases [4]. Whatsoever, this point may not be a cause of concern in the paper by *Quadrelli and Roncoroni* since, although results are expressed as percent predicted, there is still a difference between elderly subjects with long-lasting asthma and those with shorter duration of disease.

Environmental factors to which elderly subjects are exposed may be divided into medications and pollutants. On the one hand, elderly subjects suffer from nonrespiratory illnesses (e.g., cardiovascular diseases) more frequently than younger patients and, therefore, require the administration of pharmacological agents that may have

toxic effects on the airways and lung or induce hypersensitivity reactions. For example, angiotensin-converting enzyme inhibitors may induce cough [5], whereas beta blockers may provoke bronchospasm in predisposed subjects [6]. On the other hand, elderly subjects may have been exposed for a long time to environmental hazards which are deleterious to the respiratory system [2].

Finally, some nonrespiratory diseases which are frequent (but not always diagnosed) in the elderly may have respiratory consequences, e.g., left-heart failure, the presentation of which may be limited to bronchospasm [7], or gastroesophageal reflux [8].

Thus, many factors may influence etiology, presentation, and severity of lung diseases in elderly subjects; some of these factors remain poorly understood, making the care of these patients even more complex. This issue should become a high priority for research, since elderly people are getting more and more numerous.

References

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