Is physical activity anti-inflammatory on the airways?

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Further evidence that physical activity may prevent or modify airway inflammation

...In this issue of Thorax (see p 403), Shaaban and colleagues report an inverse relationship between weekly exercise and bronchial hyperresponsiveness (BHR) in 5518 adults. Participants answered questionnaires on whether “they usually exercised so much that they got out of breath or sweaty” in order to estimate weekly frequency and duration of physical activity. Although this methodology may be difficult to validate, self-report questionnaires are used routinely to obtain information in epidemiological studies. These findings are consistent with the results of two previous studies: Rasmussen and coworkers found that decreased physical fitness in childhood was significantly correlated with the development of adolescent asthma over a 10 year period, and Huovinen et al. showed in a 17 year study of 262 twins that the twin who participated in exercise conditioning had a decreased risk of asthma.

An interesting question to arise from the findings of this study is “What is the cause-effect relationship?” The authors propose that “even modest physical activity can have a beneficial effect on BHR”. One mechanism that Shaaban & colleagues considered was that deep inspirations with physical activities may be bronchoprotective. However, Skloot and colleagues showed that deep inspirations had no protective effect on BHR. Another possibility is that individuals with BHR are inactive in order to minimize or avoid respiratory symptoms, particularly breathlessness, cough and/or wheezing. The prevalence of exercise-induced symptoms in individuals with asthma, a disease characterized by BHR, ranges from 40% to 90%. Certainly, many patients with airway disease (asthma or chronic obstructive pulmonary disease) acknowledge, upon questioning, that their sedentary lifestyle is due in large part to the desire to prevent the unpleasant experience of breathing difficulty. It is possible that some individuals with BHR share this same attitude or concern. Shaaban and colleagues considered this possibility and found similar results after excluding 127 subjects who reported that they avoided exercise because of wheezing or asthma. However, elimination of only 4.6% of the population would probably have a very small impact on the overall results.

Whether physical activity provides an anti-inflammatory effect on inflamed airways and alters BHR is an intriguing proposition. The results of the study by Shaaban and colleagues add to the indirect evidence that physical activity may prevent or modify airway inflammation. However, the magnitude of this effect may be modest and may only be detected in individuals with BHR and/or mild asthma. Certainly, anti-inflammatory treatment is standard care for persistant asthma. In addition, fish oil supplementation has been shown to suppress exercise-induced bronchoconstriction; Mickleborough and colleagues proposed that this bronchoprotective effect may be attributed to the anti-inflammatory properties of fish oil. Although additional studies are needed, a randomised controlled trial with physical activity as the intervention and markers of airway inflammation together with prevention or modification of BHR as outcomes is probably not feasible or realistic.

REFERENCES


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Notes