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Title: The effect of smoking cessation on methacholine responsiveness in young asthma patients

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Body: Background: Smoking in asthma patients constitutes a major health problem. Asthma patients who smoke experience more pronounced asthma disease, but whether this is reversible is largely unknown. We hypothesized that the bronchial reactivity to methacholine in young asthma patients would decrease over a short term of 5 weeks of smoking cessation. Thus, the aim of the present study was to evaluate the effect of smoking cessation on the dynamics of airway reactivity to methacholine in young asthma patients. Material and methods: 44 steroid-free asthmatic smokers (age 19-40) were examined with methacholine challenges, spirometry and Asthma Control Questionnaire score one week before and five weeks after a smoking cessation attempt. Mean number of packyears was 16.0 (range 10-25). Asthma diagnosis was confirmed with clinical interview and one or more positive clinical tests indicative for asthma. Results: Of 44 smokers, 25 patients quit smoking successfully. The proportion of subjects with airway hyperresponsiveness (AHR) to methacholine decreased from 76% to 48% ($p=0.016$) after quitting, whereas AHR among continuous smokers was unchanged (70% and 65%, respectively, $p=1.000$). The response to methacholine decreased in the quitter group (Dose-response ratio (RDR): geometric mean 9.35 to 5.97 ($p=0.013$)), whereas it was unchanged in the non-quitters (8.37 to 6.83 ($p=0.430$)). Conclusion: Our data indicates that smoking cessation in asthma patients rapidly improves the bronchial responsiveness, a key feature of asthma, stressing the importance of smoking cessation in this group of patients. The results of the present study may contribute to increasing the motivation of asthmatics to quit smoking.