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Title: Exercise-induced bronchospasm in rhinitis schoolchildren without asthma: The French six cities study

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Body: Introduction: Exercise-induced bronchospasm (EIB) is frequent among asthmatic children. In contrast, prevalence of EIB in rhinitis children without asthma is controversial. Objectives: The aim of this study was to assess at the population level in children, the relationship between various phenotypes of rhinitis and EIB according to the presence or absence of asthma. Methods: This study is part of the Six Cities Study, the French contribution to the International Study of Asthma and Allergies in Childhood (ISAAC) Phase II. 7,781 schoolchildren aged 10 years in mean underwent skin prick test to assess sensitization and an EIB test and their parents filled a standardized questionnaire allowing to assess the presence of 'past-year rhinoconjunctivitis' (PYRC), 'ever hay fever' (EHF), and a SFAR ('score for allergic rhinitis') ≥ 7 as a marker of 'ever allergic rhinitis' and asthma-like symptoms. Results: 6,813 schoolchildren aged 10 years were studied. A fall in peak expiratory flow rate (PEFR) $\geq 15\%$ or more after exercise was found in 227 children (3.33 %). The prevalence of EIB in children without lifetime asthma, but with EHF, PYRC or SFAR score ≥ 7 was 3.22, 3.80 and 3.81% respectively. Adjusted Odds-Ratios [95% confidence intervals] between EIB and allergic rhinitis phenotypes were 1.56 [0.92-2.63] for EHF, 1.97 [1.16-3.35] for PYRC and 1.84 [1.16-2.91] for SFAR ≥ 7 . Conclusion: In our population-based sample of children, atopic rhinitis, was associated with EIB, independently of asthma.