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**Title:** Specificity and sensitivity of the methacholine challenge test for the diagnosis of asthma in athletes

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**Body:** The report of recurrent symptoms of bronchial obstruction as chest tightness, wheeze and cough provoked by exercise is a prerequisite for the diagnosis of asthma or exercise-induced bronchospasm (EIB) in athletes. The report of symptoms should be verified by the demonstration of reversibility of airflow obstruction, EIB or other methods of diagnosing either indirect or direct bronchial hyperresponsiveness (BHR). The purpose of this study was to examine specificity and sensitivity of the methacholine challenge test (MCT) for the diagnosis of asthma in athletes. Twenty seven athletes (16 M/11 F, mean age 22.0±4.3 yrs) with respiratory symptoms were studied. Lung function with assessment of reversibility to salbutamol (n=27) and challenge tests with methacholine (n=25) were performed. The specificity and sensitivity of the MCT were evaluated. Significant reversibility to salbutamol was found in 7 athletes. The fall in forced expiratory volume in one second (FEV1) following the methacholine inhalation ( $\leq 8$  mg/ml) was more than 20 % in 16 athletes (30.0±9.6 % vs 12.3±7.1 % in nonresponders (n=9),  $p < 0.0001$ ). The MCT-BHR test showed high specificity (100 %), but a lower sensitivity (80 %) and negative predictive value (55.6%). At the moderate BHR cutoff value ( $\leq 4$  mg/ml), the MCT-BHR test had a more low sensitivity (70 %) and negative predictive value (45.5 %). Assessment of bronchial responsiveness by a direct method (bronchial provocation with methacholine) is a good procedure of diagnosing asthma in athletes. The MCT-BHR test in athletes with respiratory symptoms had a high specificity and sensitivity and cutoff value for high BHR may be more useful.