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Exercise-Induced Bronchoconstriction in Chinese Elite Athletes of Olympic Summer Sports Events

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INTRODUCTION:
The aim of this study was to investigate the prevalence of exercise-induced bronchoconstriction (EIB) among Chinese elite athletes who participated in the Olympic Summer Games. The study also aimed to compare the prevalence of EIB across different sport events and analyze the characteristics of key indicators related to respiratory inflammation and ventilatory function in athletes with EIB.
METHODS:
A total of 413 elite athletes (235 females and 178 males) of 15 different summer sports were recruited for this study. They were categorized, based on their environments in which they received trainings, into either indoor (pool- or land-based) or outdoor sport events (road- or venue-based), and based on their sport events characteristics into endurance, skill, speed & strength, or team sport. Respiratory symptoms during exercise, asthma history, and EIB information were collected through a questionnaire. Pulmonary function data, including forced expiratory volume in the first second (FEV1), maximum ventilation, forced vital capacity, expiratory peak air flow rate, were collected during a bronchial exercise provocation test, and the drop rate of FEV1 was used to diagnose EIB. The inflammatory responses of each athlete were evaluated through venous blood samples, and chi-square tests, independent sample t-tests, or repeated measures analysis of variance were used to identify the significance.
RESULTS:
Of all the 413 elite athletes, a total of 109 athletes were diagnosed with EIB, resulting in an overall prevalence of 26.5%. Swimming (51.5%), hockey (40.7%), synchronized swimming (40.0%), rugby (38.5%), and track and field (33.3%) had the highest prevalence of EIB, while judo (11.1%), rhythmic gymnastics (10.5%), badminton (9.5%), weightlifting (9.5%), and wrestling (6.5%) had the lowest prevalence. Female athletes had a significantly higher prevalence of EIB compared to male counterparts (30.2% vs. 21.3%, P = 0.049). The prevalence of EIB was significantly higher in endurance events athletes than speed & strength events ones (37.3% vs. 20.0%, P = 0.038) and significantly higher in outdoor sports events athletes than indoor sports events athletes (33.1% vs. 21.6%, P = 0.05). There was no significant difference between the venue- and road-based events in outdoor environments. All pulmonary function parameters were significantly lower in athletes with EIB, indicating lower lung function than those without EIB. Athletes with EIB also had significantly higher levels of certain blood-related indexes, such as eosinophil count, neutrophil count, IL-6, IL-8, and CC16 levels, compared to athletes without EIB.
CONCLUSION:
The findings of the study reveal that Chinese elite athletes who participated in the Olympic Summer Games were significantly impacted by EIB. Athletes with EIB exhibited lower levels of lung ventilation and severe airway inflammation. As a result, stakeholders such as athletes, coaches, and sports administrations should pay close attention to EIB problems and take appropriate measures to prevent them. Specifically, monitoring inflammatory indicators is recommended as an early preventative strategy.

Topic: **Physiology**

Presentation **Poster**

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