

Why must Olympic athletes prove that they have asthma to be permitted to take inhaled β_2 -agonists?

Asthma is not rare among elite athletes. Previous reports suggest that as many as 1 of every 4 Olympic athletes representing the United States in recent Olympic Games indicated a history of having been told that he or she had asthma or a history of taking an asthma medication.^{1,2} Other studies suggest that when appropriate exercise challenges are performed, the prevalence of asthma is likewise approximately 1 in every 4 Olympic athletes, but not necessarily in the same athletes who have histories of asthma.^{3,4}

Given the apparent increase in the prevalence of asthma and the large number of Olympic athletes using inhaled β -agonists (IBAs), the Medical Commission of the International Olympic Committee (IOC) convened a workshop in Lausanne, Switzerland, in May 2001. Participants were asked to examine use of IBAs in Olympic competition.

Late in 2001, the Medical Commission released new rules requiring that every asthmatic Olympic athlete be tested before receiving permission to use an IBA at the 2002 Olympic Winter Games.⁵ The background in that document included the following statement:

- At recent Olympic Games, there had been a large increase in the number of athletes notifying the need to inhale a β_2 -agonist.
- Some athletes may have been misdiagnosed and did not have asthma and/or exercise induced asthma or bronchoconstriction (EIB).
- There is no scientific evidence to confirm that inhaled beta 2 agonists enhance performance in doses required to inhibit EIB.
- A skewed distribution of notifications of beta 2 agonists by sport was observed with a higher prevalence in endurance sports.
- The geographic distribution of notifications of inhaled beta 2 agonists was markedly skewed but correlated well to the reported prevalence of asthma symptoms in those countries.
- There is some evidence that daily use of an inhaled beta 2 agonist may result in tolerance to the medication.

Abbreviations used

EIB: Exercise-induced asthma or bronchoconstriction
IBA: Inhaled β -agonist
IOC: International Olympic Committee

- Inhaled corticosteroids may be under used in athletes notifying the use of beta 2 agonists.
- Eucapnic voluntary hyperpnoea (EVH) was considered to be the optimal challenge to confirm that an athlete has EIB.
- Beta 2 agonists when administered systemically do have anabolic effects.

The IOC document concluded that “[a] notification form from a physician stating that the athlete has asthma and/or exercise-induced asthma (or bronchoconstriction) will no longer be acceptable evidence for that athlete to inhale a permitted beta 2 agonist at the Olympic Games in Salt Lake City [Utah].”

The new regulations required that athletes provide the following documentation:

The physician should detail respiratory symptoms suggestive of airway obstruction . . . that may include consultations with (the athlete’s) physician for treatment of asthma, hospital emergency department attendance or admission for acute exacerbations of asthma . . . For those athletes, who experience airway obstruction only on exercise . . . a full history of this including types of exercise that cause EIB and medication(s) taken to prevent and relieve it are required, in addition to:

- . . . [A] 12% or greater increase in FEV₁ calculated as a percent of the predicted FEV₁ after the administration of an inhaled permitted beta 2 agonist
 - Bronchial provocation with an indirect agent, either an exercise challenge in the laboratory or in the field or eucapnic voluntary hyperpnoea . . .
 - Bronchial provocation with methacholine may be accepted . . .
- Peak expiratory flow rate measurements are unacceptable.

In this issue of *The JACI*, Sandra Anderson and other members of the independent panel⁶ describe the results of requiring this documentation for athletes wishing to take IBAs at the 2002 Winter Olympic Games in Salt Lake City. They indicate that there were 165 applications to take IBAs and that 147 athletes (89%) submitted objective evidence of a challenge or a response to bron-

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chodilator (163 tests); 130 (79%) of the applications were approved. Data from this report show that (1) the mean increase in FEV₁ for those with positive bronchodilator test results was 16.2% predicted FEV₁ in 13 athletes, (2) the mean fall in FEV₁ in those with positive physical challenge results was 15.9% in 36 athletes, and (3) the PD₂₀ FEV₁ was 173 µg for pharmacologic (methacholine or histamine) challenge in 45 athletes. Overall, only 5.2% (130) of the 2517 athletes were permitted to take IBAs; this is much smaller than the percentage thought to have had asthma who participated in the 1998 Olympic Winter Games.

Many in the sports medicine community have asked why this policy has been implemented, especially in view of the statements from the IOC that there is no scientific evidence to confirm that inhaled β₂-agonists enhance performance in doses required to inhibit EIB. Although studies do suggest that systemically administered β₂-agonists might enhance performance (in doses well above those required to relieve bronchospasm or prevent EIB), it is not clear how an athlete would benefit from the use of an IBA if he or she does not have asthma.⁷ Consequently, why did the IOC not simply ban systemically administered β₂-agonists?

Examining the data reported in this issue by Anderson et al,⁶ one could be left with the impression that (1) only 5.2% of the athletes who participated in the 2002 Winter Games had asthma and (2) the IOC is correct in claiming that a large number of athletes take IBAs who do not have asthma. However, this would leave unexplained the observations by Wilber et al,³ who found the overall incidence of exercise-induced bronchospasm in athletes from 7 sports (biathlon, cross-country skiing, figure skating, ice hockey, Nordic combined, long-track speed skating, and short-track speed skating) on the 1998 US Winter Olympic Team to be 23%. Wilber et al tested athletes in their venue during "actual competition" or during "simulated competition." The criteria for a positive exercise challenge result in the study by Wilber et al were similar to what was required for a positive challenge result by the IOC.^{3,5} Thus, there are compelling data to suggest that considerably more Olympic athletes than those identified by the IOC might have had asthma (especially exercise-induced asthma). One possible explanation is that the new IOC regulations actively dissuaded athletes from seeking treatment. Wilber et al stated that their objective was "to determine the incidence of exercise-induced bronchospasm among US Olympic winter sport athletes." The IOC, on the other hand, apparently wanted to limit the use of medications by athletes in Olympic competition.

After the IOC released its recommendation, some of our younger athletes with asthma asked whether they could continue to take their asthma medications without

risking sanctions. It is very important that practitioners explain that younger athletes are not governed by the same rules as Olympic athletes and that not taking asthma medications could have serious consequences.

Moreover, it is somewhat difficult to reconcile the data reported by Anderson et al⁶ with the following observations: (1) Exercise-induced asthma in some elite athletes might be a normal phenomenon, dependent to some extent on the amount of exercise and the degree of airway cooling/airway drying.⁸⁻¹⁰ (2) The change in FEV₁ after exercise forms a bell-shaped curve (because the data are normally distributed), which suggests that there is no magical drop in FEV₁ that explicitly diagnoses exercise-induced asthma.¹¹ (3) Wilber et al³ reported that 50% of the cross-country skiers in their study who performed challenges had drops in FEV₁ of at least 10% when they participated in their venue.³

One benefit of the new regulations is that over time the IOC might obtain considerably more information about the prevalence of asthma in a population of elite athletes. It is to be hoped that the IOC Medical Commission will permit these data to be published so that we can become more enlightened about the true prevalence of asthma in Olympic athletes.

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