

The elite athlete: Yes, with allergy we can

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On August 8, 2008, Beijing will welcome the XXIX Olympic Games, and a fourth to a third of the elite athletes from many of the national delegations in the multinational crowd taking part in the Opening Ceremony will have allergic or respiratory disease according to data published for several national delegations at previous Games.¹⁻³

Mechanisms for the high prevalence of allergic diseases, including exercise-induced bronchospasm, in elite athletes—even higher than in the general population—still wait for further research. Although moderate physical activity is suggested and appears beneficial in allergic subjects to avoid risks associated with overweight and a sedentary lifestyle, intense and prolonged physical activity has been shown to induce marked changes in several parameters of innate and adaptive immunity.⁴ These include a T_H2 shift and a transient immunodeficiency that have been related to the higher prevalence of allergy and upper respiratory diseases in athletes.⁵ Certainly, hyperventilation and exposure to allergens and pollutants may cause bronchial hyper-reactivity even in subjects with no clinical asthma and/or allergy. In this issue of the Journal, Anderson and Kippelen⁶ have written an outstanding manuscript reviewing exercise-induced asthma and exercise-induced bronchoconstriction and the varied presentations depending on the type of sport and the athlete. Along with the discussion of pathophysiology is an explanation of why and how therapies are successful and why at times the contrary occurs.

Surprisingly, however, in spite of the high prevalence of allergic diseases in elite athletes, allergy tests are often not part of the routine medical examination in sports medicine. This is even more questionable when considering that the treatment of allergic athletes implies several important issues such as

environmental control, use of drugs that may affect vigilance and performance, or therapeutic use exemption of antiallergic and antiasthmatic drugs included in the list of substances prohibited by the World Anti-Doping Agency in and out of competition.⁷ Therefore, we strongly recommend that standardized practice parameters are set to include allergy assessment among clinical investigations to be performed in athletes and nonprofessional exercisers when indicated.

In 2002, before the Salt Lake City Winter Games, the International Olympic Committee was extremely concerned about the wide and increasing use of β_2 -adrenergic agents by athletes and in response set strict criteria that required documentation of asthma in an attempt to limit the use of these drugs.

Certainly, the use of β_2 -agonists in the context of exercise implies not only their potential, and controversial, effects on performance but also safety issues when considering the US Food and Drug Administration black box and the additional safety concerns that these drugs may have in elite athletes because of the intense cardiovascular and respiratory stress they undergo during competition.⁸⁻¹¹ Weinberger's article¹² in this issue discusses the role β -agonists in exercise, and he calls special attention to the potential tolerance induced over time with routine use of β -agonists. In fact, the role of long-acting β -agonists in exercise is challenged by the evidence of the loss of a bronchoprotective effect by albuterol when using either formoterol or salmeterol on a routine basis.

Criteria for diagnosing asthma in athletes have been an object of wide scientific debate and have been recently revised by the International Olympic Committee, as summarized in the Workshop Summary. In the article by Fitch,¹¹ the author reports that the International Olympic Committee requests a positive bronchial challenge for the confirmation of exercise-induced asthma or exercise-induced bronchoconstriction in athletes to obtain permission for the use of β -agonists. Because the International Olympic Committee requires objective evidence of asthma, exercise-induced asthma, or exercise-induced bronchoconstriction to be approved for using β -agonists, one of the major questions that arises when screening athletes for asthma is which test to use.

This issue of the Journal reviews exercise challenge tests and their surrogates that may be useful to evaluate bronchial hyperreactivity in athletes. These challenge tests can be used to diagnose asthma, help exclude diseases that mimic asthma, allow an assessment of the effectiveness of medical therapy for asthma, and can be used to confirm control of the asthma before participating in activities known to trigger exercise-induced bronchoconstriction—for example, scuba diving. Rundell and Slee¹³ also address the difference between direct and indirect challenges, pros and cons of the different challenges, how to interpret the data generated from the test, and standardized procedures to be used to assess the athlete.

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Treatment	WADA rules	Notes
Oral beta-2 agonists	Prohibited	
Ephedrine, methylephedrine	Prohibited in competition	A concentration in urine greater than 10 ug/ml represents an adverse analytical finding
Oral corticosteroids	Prohibited in competition require TUE	
Topical corticosteroids	Require A-TUE	Topical preparations for dermatologic, auricular, nasal, buccal, and ophthalmic use are not prohibited
Inhaled beta-2 agonists <i>salbutamol, terbutaline formoterol, salmeterol</i>	Require A-TUE	A concentration of salbutamol greater than 1000 ng/ml is considered an adverse analytical finding unless proven secondary to therapeutic use
Antihistamines	Permitted	Second generation molecules should be preferred to minimize side effects particularly on vigilance
Anti-leukotrienes	Permitted	
Immunotherapy	Permitted	IT should not be performed immediately before or after physical exercise

FIG 1. World Anti-Doping Agency rules for antiallergic drugs. WADA, World Anti-Doping Agency; TUE, Therapeutic Use Exemption; A-TUE, Abbreviated Therapeutic Use Exemption; IT, immunotherapy.

In Fig 1, we list the antiallergic and antiasthmatic medications that are banned (*red*), restricted and under Therapeutic Use Exemption (*yellow*), and permitted by the World Anti-Doping Agency (*green*).⁷ The World Anti-Doping Agency Web site has a site-specific section for asthma therapies. Both corticosteroids and β -agonists can be used but require the Therapeutic Use Exemption application procedure. Alternatives to both are leukotriene receptor antagonists, anticholinergics, sodium chromoglycate (chromones), and theophyllines (xanthines), and the use of these alternate agents is not restricted.

In summary, there is no doubt that allergic and respiratory diseases have the potential to interfere with performance. However, many athletes with allergic diseases, including asthma, will successfully compete in the games, and we expect some will go on to receive medals. The high number of allergic gold medalists should be an inspiration to those who participate in physical activities or hope to compete in sporting events and should reassure athletes and nonprofessional exercisers that, even with allergies and asthma, “Yes, we can.”

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