MINI-REVIEW

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Treating allergic rhinitis in the athlete*

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SUMMARY

Allergic rhinitis may affect athletes like any other member of society. It is a major problem for the atopic athlete. Either perennial or seasonal, it may cause problems with nasal function depending upon the type and quantity of allergen exposure. Moreover, exposure to irritants, chemicals and air pollutants may exacerbate allergic rhinitis. In this patient group, special diagnostic and particularly therapeutic considerations are warranted for the disease. Treatment of the athlete should be based on two important principles: no medication given should be on any list of doping products and no medication used should affect the athlete's performance. Antihistamines, topical cromolyn, and topical steroids may be used to control allergic rhinitis without violating 'anti-doping' regulations.

Key words: allergic rhinitis, athlete, treatment

INTRODUCTION

Athletes, like any other member of society, may have problems related to the nose. From the weekend tennis player to the elite Olympic competitor, athletes can experience problems due to allergic rhinitis. Allergic rhinitis, either seasonal or perennial, causes problems with nasal function depending on the type and quantity of allergen exposure. Symptoms may range in severity from annoying to life threatening. Particularly elite Olympic athletes should be screened for the possibility of allergy and have medical programs with permitted medication tailored to meet their needs. Appropriate management will enable allergic athletes to compete effectively, without disadvantages in their sport practice.

EXERCISE AND ALLERGIC RHINITIS

Physical exercise acts as a potent vasoconstrictor. The nasal resistance decreases gradually with increasing pulse, due mainly to release of noradrenaline (International Rhinitis Management Working Group, 1994). In all cases of nasal obstruction due to vasodilatation, physical exercise will increase patency, with the effect frequently unobserved by the individual. Although no rebound occurs and vasoconstriction persists for about one hour in normal circumstances, in athletes - especially long distance runners, cyclists, and triathletes - a rebound effect is detectable after the initial improvement in nasal patency, which may affect peak performance.

Short bursts of sprinting require nasal breathing for the best performance. A change in the breathing pattern may affect the outcome (Katz, 1984). During exercise sympathetic and parasympathetic nerves discharge, but the sympathetic response predominates with constriction of vessels. Association of exercise with improved nasal patency can be explained by this condition. Exercise, however, also acts as a beta-adrenergic stimulator thus stabilising both mast and basophilic cells to prevent the release of different mediators. On the other hand, some athletes may complain of nasal congestion & coryza during exercise. Exercise-induced rhinitis (EIR) is the least well characterised of exercise induced allergic syndromes (Silvers, 1992). Nasal and sinus obstruction, irritants exacerbating vasomotor rhinitis, and allergic rhinitis are all problematic to the athlete.

Athletes may experience allergic rhinitis, which affects 15% of the population (Blumenthal, 1990). While sport participation *per se* does not make these symptoms more likely, the exercise environment may expose athletes to common allergens. Since the increased minute ventilation that occurs with exercise brings the nasal passages into contact with greater volumes of air, symptoms may often occur with exercise (Briner and Sheffer, 1992).

It has been well documented that exercise can induce a decrease of nasal resistance in the human nose (Katz, 1984). However, other investigators showed a significant increase in unilateral nasal resistance in 30% of asthmatic children after exercise and this phenomenon was called exercise induced nasal obstruction (Hasagawa et al., 1985). Syballo et al. (1985) reported, a rebound increase of nasal resistance 20 to 30 minutes after exercise in normal subjects and 5 to 10 minutes after exercise in asthmatic patients with rhinitis. Further studies of

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90 patients with allergic rhinitis and 26 normal subjects showed that allergic patients as well as normal subjects have a marked decrease of nasal resistance immediately after exercise (Ohki et al., 1989). However, in allergic patients the total resistance returned to preexercise levels soon after the exercise and then surpassed it, while in normal subjects the return to the pre-exercise level was gradual and did not surpass it.

FACTORS CONTRIBUTING TO HEALTH PROBLEMS IN ALLERGIC ATHLETES

The athletes may experience several problems related to their noses. These contributing factors may be more troublesome for the allergic athlete (Fitsch, 1984).

Infection

One of the most commonly encountered ailments among the athletes is minor respiratory infection. These are predominantly viral infections. The allergic athlete with nasal or bronchial hyperreactivity (or both) may experience more pronounced symptoms and greater interference with training and performance.

Stress and emotional factors

Undoubtedly, sports competitions are stressful. Stress-induced conditions are a major source of medical consultation of team physicians. Journalists both from television and written media exert immense pressure upon athletes as well.

Environmental factors

Polluted air, such as SO_2, ozone, sulphates in the outdoor air and formaldehyde, paints, cleaners in indoor gymnasiums may be triggering factors for the allergic athlete.

The nasal mucosa is sensitive to temperature as well as allergenic particles. Exposure to cold air, changes in temperature and humidity may affect the performance of allergic athletes in events held outdoors.

Allergens

Allergic athletes must struggle with the ever-present problem of encountering allergens that aggravate their conditions. In pre-Olympic training camps, indoor allergens such as house-dust mites and moulds can be potential hazards. Moreover, about one third of sportsmen conduct their competitions indoors. On the other hand, pollens in the air can be problematic for the allergic athlete in outdoor events. Grass pollen, for example, is airborne in high concentrations during the spring and early summer, while weed pollens may cause problems in late summer and fall. Baseball players, golfers, football players, and those involved in other field sports face significant exposure, especially on windy days and after a recent mowing. Mould spore counts tend to be high in the air whenever climatic conditions produce heat and moisture.

For the competitor with food allergies, it is a potential hazard to sample different and previously untried dishes.

Table 1. Rhinitis medications banned by the USOC/IOC & considered doping.*

Class of Substance	Agents
Vasoconstrictors	Desoxyephedrine (oral or nasal) Ephedrine (oral or nasal) Phenylephrine (oral) Phenylproponalamine(oral or nasal) Propylhexedrine (oral or nasal) Pseudoephedrine (oral or nasal)
Corticosteroids	CS banned except for topical use (ear, eye & skin), inhalation therapy (AR & asthma) & local intra-articular injections* Taking CS (prednisolone, methylprednisolone) orally or IV is banned.

* These are allowed if the athlete can submit a declaration from the prescribing physician on the therapeutic indications.

TREATMENT

Athletes with rhinitis and sinusitis and their team medical advisors are confronted with major and unnecessary difficulties. Many sympathometic agents (e.g., ephedrine, pseudoephedrine and phenylpropanolamine) that are in common use are banned, but these drugs are available in combination preparations and do not require medical authority to purchase. Therefore athletes and coaches do not consider them to be drugs. For example, in Sydney 2000 a gymnast was stripped of her all-around gold medal by the International Olympic Committee (IOC) after testing positive for a banned substance. She had accepted a cold pill from a team doctor that contained the banned substance pseudoephedrine. The team doctor has been expelled and suspended for the 2004 Olympics, since he gave the girl the medicine which led to the positive test (Ticker, September 26, 2000 www.allsports.com). Medical doctors have the responsibility in treating these people but must be careful while prescribing medicine.

Regimens for therapy depend on the severity of the symptoms and the associated initiating causes. Prescription of medication for the competitive athlete should be based on two important principles: (1) no medication given to the athlete should be on any list of doping products and should be approved for use by the U.S. Olympic Committee (USOC) and International Olympic Committee(IOC) and (2) no medication should adversely affect the athlete's performance (Table 1 and 2).

Antigen avoidance

Antigen avoidance is the first step in the treatment of allergic athletes. Attempts should be made to maximise the environmental control measures when possible. In pre-Olympic training camps and the Olympic village, house dust mites are potential problems for the allergic athlete. Mite avoidance can

Table 2. Classification of drugs for the treatment of Allergic Rhinitis in the athlete.

Permitted for use in competition	- Histamine antagonists - Cromolyn - Topical (nasal or ophthalmologic) phenylephrine & imidazole - Topical Corticosteroids

be attempted by reducing indoor humidity, by application of acaricides and by the use of mite-proof covers. However, it is more difficult to reduce exposure to pollens. For weekend players, involved in field sports such as baseball, golf and football, sport activities can be limited when pollen counts are high, especially on windy days and after a recent mowing. On the other hand antigen exposure may not be prevented effectively during Olympic competitions. For that reason during Olympic games, Olympic team managers and medical officers need to adequately prepare Olympic athletes for the possibility of exposure to high pollen levels. This may involve preventive therapy with medication or immunotherapy.

Antihistamines

An athlete who suffers from allergic rhinitis has an arsenal of antihistamines from which to choose for relief of symptoms. The decision to select a particular medication involves consideration of its efficacy and side effects.

An adverse influence on physical performance may occur in the athlete with rhinitis treated with first generation antihistamines which may have undesirable sedative and anticholinergic affects involving the nose, throat and eye (Dykewicz et al., 1998). Another anticholinergic effect that may occur is impaired sweating, which may be a problem with heavy workouts on hot days (Kolski, 1982). The newer, non-sedating antihistamines are equal to the standard agents in efficacy and comparable with a placebo in central nervous system effects. Second generation antihistamines cause little or no somnolence, do not affect psychomotor performance and have no anticholinergic effects. For that reason, second generation antihistamines are favoured for sports activities. Despite their widespread use, the effects of treatment with antihistamines on exercise performance (e.g. metabolic responses and time to exhaustion) have scarcely been addressed. Montgomery and Deuster (1993) indicated that single oral administrations of antihistamines neither compromised nor enhanced exercise performance or tolerance in asymptomatic individuals. However, in this study the effects of antihistamine ingestion on exercise performance in symptomatic individuals were not examined. The effect of treatment with intranasal azelastine on exercise performance were evaluated on physically active males with allergic rhinitis and no adverse effect on exercise performance was observed (Chicharro et al., 1998).

Whereas there is a dearth of information on the effects of antihistamine medications on exercise performance, there is growing evidence that pre-treatment with antihistamines may increase tolerance to exercise in individuals susceptible to allergic disorders (Montgomery and Deuster, 1993).

Decongestants

Decongestant use is more controversial in sporting events. Both topical and systemic decongestants are banned with the exception of topical (nasal or opthalmological) phenylephrine and imidazoline preparations (Dykewicz et al., 1998). While a healthy weekend tennis player may use an oral decongestant such as pseudoephedrine to relieve nasal congestion, high levels of decongestant medications are banned during Olympic competitions. As little as one dose of a sympathometic amine can cause an athlete to be disqualified for doping. Since decongestants in high concentrations have pharmacological profiles similar to stimulants, such as amphetamines, they may both unfairly enhance performance and lead to health risks. On the other hand, Sidney and Lefcoe (1977) examined the possible ergogenicity of the sympathometic amines (ephedrine) in a prospective study and observed no effect on any of the measures of physical work capacity.

It must be kept in mind that long term use of topical decongestants causes development of rebound decongestion. Other forms of topical therapy, such as normal saline as irrigation agents, can be prescribed and have no side effects.

Cromoglycates

Cromolyn is an intranasal mast cell stabiliser used for the prophylactics of allergic rhinitis. This group of drugs may be useful in preventing reactions to inhaled allergens such as pollen, mold, dander and house dust mite. For symptoms of rhinorrhoea, sneezing or itching intranasal cromolyn has a good safety profile for Olympic competitions. However, these medications must be taken for at least several days prior to exposure to control the symptoms of allergic rhinitis.

Steroids

Nasal topical steroids may be helpful in athletes with allergic rhinitis due to their anti-inflammatory action. Unlike systemic steroids, topical steroids appear to act locally and are not absorbed to cause any systemic effects. Nasal steroids are especially recommended when symptoms are severe and nasal obstruction is the prominent symptom.

According to the International Olympic Committee (IOC) category, glucocorticoids are in the “class of prohibited substances in certain circumstances” (British National Formulary, 2001). Inhalation, nasal or ophtalmological routes are permitted. However, these are allowed if the athlete can submit a declaration from the prescribing physician on the therapeutic indications. On the other hand, taking corticosteroids orally or by intravenous and intramuscular injection is prohibited.

Immunotherapy

In athletes with pollen, mold or house dust mite allergies, immunotherapy for specific allergens may be considered. It

may provide help for those athletes with seasonal allergic rhinitis not responding adequately to avoidance and medication. This should be started 3 months before the sports season and the patient is advised against heavy physical exercise on the day of the injection (International Rhinitis Management Working Group, 1994). But immunotherapy may cause discomfort at the site of the subcutaneous injection for several days. Selection of proper candidates for immunotherapy must always be weighed against the added risk of adverse reactions.

There are several mechanical devices (such as Breathe Right Nasal Strips) available for relief of nasal congestion and are used by many professional athletes. However, these are less effective for many allergic patients since nasal turbinate swelling occurs within the bony vault of the nose, which cannot be expanded by a mechanical device.

CONCLUSION

Considering these issues, the optimal therapy for the allergic athlete consists of antigen avoidance, a second generation H1-antihistamine and a topical steroid. Intranasal cromolyn may be of benefit if taken approximately 30 minutes prior to competition likely to be associated with high antigen exposure. In cases of seasonal allergic rhinitis, immunotherapy may reduce the need and amount of additional medication.

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