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## EXERCISE-INDUCED ALLERGIC SYNDROMES ON THE INCREASE

The popularity of jogging and other forms of aerobic physical conditioning has increased the incidence of exercise-induced allergic syndromes; cholinergic urticaria, asthma, and anaphylaxis are the most common. Most patients, even those who have life-threatening anaphylaxis, are reluctant to give up exercise programs; fortunately, treatment is possible in most cases, and treatment options are improving.

### CHOLINERGIC URTICARIA

Cholinergic urticaria can result when core body temperature rises enough (0.7 °C to 1°C) to cause perspiration. In susceptible individuals, perspiration triggers a cholinergic reaction that is characterized by histamine release and the development of small pruritic papules, 1 to 2 mm in diameter, surrounded by a large area of flare and erythema. Two to 30 minutes of exercise is enough to cause perspiration and a reaction that lasts for 20 to 90 minutes.

Cholinergic urticaria predominates in adolescents and young adults, who may have the symptoms for years and then experience spontaneous remission. Exercise is the most common trigger of attacks (89% in one epidemiological study); emotional stress and hot, spicy foods can induce cholinergic reactions in some patients.

Drug therapy with H<sub>1</sub> antagonists helps some of these patients. Hydroxyzine is useful, but the dosage may have to be as high as 200 mg/day, which can be sedating.

Ketotifen, an experimental drug, has shown promise in clinical studies, where it appears to prevent exercise-induced symptoms and the postexercise rise in plasma histamine that is observed with this syndrome.

### EXERCISE-INDUCED ASTHMA

Exercise is a well-known trigger of asthma. The asthmatic response can be somewhat attenuated by breathing warm, moist air during exercise; this may be why swimming, for example, is better tolerated than free running. Typically, about six minutes of sustained exertion

is required to trigger an asthmatic response; therefore, baseball, where exertion occurs in brief spurts, is also better tolerated than long-distance running.

Bronchoconstriction in both large and small airways occurs within 3 to 15 minutes after completion of exercise. Mild asthma may resolve within 10 to 15 minutes, but in people who have severe reactions, obstruction may continue for several hours.

Exercise-induced asthma can be prevented or modified by aerosolized delivery of a sympathomimetic agent or cromolyn sodium. The drug should be inhaled before exercising.

Albuterol effectively prevents the acute phase and beclomethasone attenuates the late-phase response. In clinical studies, inhaled cromolyn sodium, which is underused in this country, prevents both the acute and late-phase responses.

### EXERCISE-INDUCED ANAPHYLAXIS

Itching, urticaria, cardiovascular collapse, and respiratory obstruction are the common features of exercise-induced anaphylaxis. The syndrome is life-threatening and typically affects teenagers and young adults.

Running is the usual trigger, but some patients collapse after brisk walking. Many, but not all, have a history of atopy.

Although cholinergic urticaria and exercise-induced asthma can be reproduced in the laboratory, it is difficult to induce anaphylaxis. Even among patients with histories of anaphylaxis during free running, the episodes are not predictable. Joggers frequently collapse who have been running without incident for years.

Obviously a cardiac event should be ruled out when an individual collapses during exercise, but evidence of histamine release, such as pruritus or urticaria, suggests that anaphylaxis is the cause. In a few cases, eating within the last 2 hours, or a specific food allergy, has been related to exercise-induced anaphylaxis.

Patients with histories of anaphylaxis should carry adrenalin at all times. They should never jog alone, but only with a partner who can initiate adrenalin therapy in the event of an attack.

The Epi-Pen permits easy, self-administration of a 0.3-mL subcutaneous dose of epinephrine into the lateral thigh. A new approach is the delivery of epinephrine via a metered-dose inhaler such as Primatene Mist. Ten to 20 puffs of inhaled epinephrine produces approximately the blood levels achieved by subcutaneous administration of 0.5 mL of 1:1,000 epinephrine, and more reliably produces blood levels in the therapeutic range. Inhalation is particularly helpful when throat angioedema is present.

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#### BIBLIOGRAPHY

Casale TB, Keahey TM, Kaliner M. Exercise-induced anaphylactic syndromes: insights into diagnostic and pathophysiologic features. *JAMA* 1986; 255:2049–2053.

Heilborn H, Hjemdahl P, Dalskog M, Adamsson U. Comparison of subcutaneous injection and high-dose inhalation of epinephrine: implications for self-treatment to prevent anaphylaxis. *J Allergy Clin Immunol* 1986; 78:1174–1179.

Sheffer AL, Soter NA, McFadden ER Jr, Austen KS. Exercise-induced anaphylaxis: a distinct form of physical allergy. *J Allergy Clin Immunol* 1983; 71:311–316.

## MANAGING SLEEP DISORDERS IN THE ELDERLY PATIENT

The image of Grandpa nodding off to sleep in his chair is a stereotype, but the condition is not normal. Some social and physiologic changes associated with aging may cause sleep disruption, but sleep apnea, nocturnal leg movements, esophageal reflux, and the use of hypnotics and other medications also can contribute to daytime sleepiness in the elderly and should be considered in a diagnostic evaluation.

Sleep is an active physiologic process. Specific electroencephalographic (EEG) criteria are used to distinguish rapid eye movement (REM) from non-REM sleep; the latter ranges from stage 1, or light sleep, to stage 3 and 4 (deeper, delta sleep). Normally, there is cyclic alternation between non-REM and REM sleep, with REM sleep accounting for 20% to 25% of total sleep time.

As we age, there is little change in total sleep time, but sleep is less efficient. We spend more time in bed, but it takes longer to fall asleep (sleep latency), there is less deep sleep, and awakenings are more frequent.

#### DIAGNOSTIC VALUE OF HISTORY

In most instances of sleep complaints, a careful history that includes the bed partner or caregiver can provide enough information to make a diagnosis and start treatment—for example, whether the patient takes too long to fall asleep, has frequent awakenings, awakens too early in the morning or has excessive daytime sleepiness; whether he or she retires and gets up at regular times; whether there are disruptions during the night such as noise, needing to use the bathroom, or awakening because of pain; whether the patient uses medication or alcohol; whether the patient eats, exercises, or watches TV before going to bed; and whether there are life stresses, such as marital discord or a death in the family. The bed partner also may provide information about snoring, which suggests possible sleep apnea, and nocturnal leg movements, which the patient may be unaware of.

A careful drug history is important, and should include queries about alcohol, caffeine, and over-the-counter preparations. Among the medications that can interfere with sleep are steroids, adrenergic agonists, diuretics, and theophylline.

Certain age-related physiological changes can interfere with normal sleep, such as decreased bladder capacity, menopausal vasomotor activity, and discomfort or anxiety from heart disease or arthritis. Gastric reflux also is a common cause of sleep disturbance in elderly patients.

Restless leg syndrome (the “creeping” sensation that makes it impossible not to keep moving) and periodic leg movements during sleep (nocturnal myoclonus) occur more frequently among the elderly. They prolong sleep latency, cause increased sleep fragmentation, and decrease deep sleep. Some patients complain of insomnia, others of excessive daytime sleepiness.

#### SLEEP HYGIENE, DRUG THERAPY

Behavioral approaches to sleep disturbance are helpful, and should be attempted before resorting to therapy with hypnotic drugs. The patient should be educated to retire and, more importantly, to get up at the same time every day, including weekends. Individuals who have sleep problems should avoid caffeine after breakfast and avoid all alcohol. Regular physical exercise is helpful, but not at bedtime. The bedroom should be used only for sleeping, not for paperwork or watching television.

Weight loss, avoidance of sleep medications and nighttime alcohol, and changes in sleeping position to