Dynamic Chiropractic

ALLERGIES / ASTHMA

Nutritional Influences on Exercise-Induced Asthma, Part 1: Salt

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Government statistics show that more than 24 million Americans suffer from asthma. This is approximately 12 percent to 15 percent of the adult population over the age of 18.[1] In 2005, asthma attacks caused the death of 3,884 Americans.[2] Exercise-induced asthma (EIA) affects 80-90 percent of asthma patients.[3] A survey revealed that only 21 percent of National Collegiate Athletic Association trainers said that their athletic departments had specific written protocols for exercise-induced asthma and/or bronchospasms when they occurred during practices or games.[4]

EIA Defined and Diagnosed

Forced expiratory volume (FEV1) is the amount of air that can be forcefully exhaled in one second after taking a deep breath. A post-exercise FEV1 reduction greater than 7 percent indicates abnormal pulmonary function. Exercise-induced asthma is defined by a 10 percent or greater reduction in FEV1 following bronchoprovocation.5 EIA is usually diagnosed when exercise causes coughing, wheezing, shortness of breath, chest tightness and premature fatigue.

EIA Mechanism

At rest, we breathe through our noses. Our sinuses warm and filter the air. When we begin to exercise, we breathe through our mouths due to the increased amount of air required. Individuals who suffer from asthma, allergic rhinitis, respiratory disease or overly sensitive tissues are vulnerable to bronchoconstriction when large amounts of air suddenly reach the lungs.[3] Other triggers for exercise-induced asthma include the duration and intensity of exercise itself, the level of fitness, recent upper-respiratory infection and triggers in the air we breathe, such as smoke, pollen and dust.

EIA Rates in Various Groups	
Asthmatics	80-90%
Allergic rhinitis sufferers	35-45%
People w/o respiratory disease	3-10%
Total population	12-15%

The Salt Connection

In a review on nutrition and asthma, it was concluded that salt increases airway sensitivity in EIA patients and causes a greater bronchoconstrictor response to exercise.[6] Salt impedes arterial oxygen saturation by increasing capillary permeability. Salt promotes leukotriene and interleukin production, leading to the formation of mucus and edema. When mucus and edema are present, the airway diameter is reduced. Suddenly, the EIA patient has two additional problems in addition to

the original trigger: a lack of oxygen in the blood and a reduction in the amount of oxygen they can inhale. This double deficit further strains the body, resulting is an asthma-like symptom complex. When dietary salt is reduced, the reactions are reversed.

Effect of Exercise on Airway Reactivity (EIA Patients)			
Dietary salt	Low	Medium	High
FEV1	-7.9%	-18.3%	-27.4%
Puffs*	12	18	26
*Number of breaths needed on a bronchodilator during the exercise tests.			

In a recent double blind-study, 24 subjects with EIA preformed an exercise challenge test to establish a baseline, and then a test each 14 days afterward. They followed a low- (~1,450 mg per day), moderate- (~3,500 mg per day) or high- (~9,900 mg per day) sodium diet.[7] Results showed that salt intake inversely related to FEV1 (higher salt intake was associated with reduced FEVI) and directly related to number of bronchodilator "puffs" required during the exercise challenge test (higher intake was associated with increased number of puffs required).

Next month, in part 2 of this article, we will explore nutritional factors that, unlike salt, *reduce* EIA severity.

References

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JULY 2009