Exercise-Induced Bronchospasm (EIB)

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Asthma is an affliction of the respiratory system in which the airway passages in the lungs are hyper-sensitive and prone to becoming irritated, a condition known as airway inflammation. When irritated, the passages are restricted due to the presence of mucus buildup in the airway, limiting the flow of air into the lungs. The passages can also become restricted when the muscles surrounding the airways either tighten or spontaneously spasm, a condition known as broncho-constriction. Asthma is characterized by wheezing, an inability to get the required amount of air into the lungs, as well as by a chronic inflammation of the passages. Environmental factors such as dust and air pollution may either exacerbate or trigger an asthmatic episode.

There is no physical attribute more important to an athlete than being able to breathe effectively and without hindrance. Asthma is the most common and the most debilitating illness to affect the lungs and breathing passages, with approximately 17 million people afflicted with this condition in North America alone. While generally a condition that is of greater concern regarding quality of life than as a cause of death, asthma, both as a free-standing condition and in combination with other factors, can be fatal. Asthma manifests itself in a number of variations, all of which are believed to share a common genetic basis.

Asthmatics who engage in athletics will commonly experience one of two related conditions during sports: an exercise-induced asthma attack, or an exercise-induced bronchospasm (EIB).

The progression of an exercise-induced asthma attack commences with vigorous exercise. Exercise places a demand upon the body for a greater amount of oxygen, which in turn results in an increased breathing rate. The rush of air through the passages of the lungs tends to cool and dry out the surface of the passages. Structures in the lungs known as the mast cells are believed to produce a chemical substance, a mediator, which stimulates the surrounding muscles to go into a spasm. The spasm constricts the airways, making it very difficult for the athlete to get sufficient air into the lungs.

Exercise-induced bronchospasm (EIB) causes particular and more frequent problems for young athletes, who may not possess the knowledge of their bodies to fully understand the asthma mechanism or its dangers. It is believed that some children will lose their susceptibility to asthma attacks as they advance through puberty, and outgrow the illness by age 20.

EIB will commonly occur immediately after six to eight minutes of vigorous exercise, with the attack persisting for between 10 and 15 minutes; it is most severe at this initial stage. There follows a period of between 30 to 90 minutes, during which the athlete will likely experience few, if any, effects from bronchospasm. In some cases, there may be a further recurrence of EIB one to two hours later. Other factors that contribute to the onset of an EIB episode are cold air conditions, dry air, airborne pollution and particles, preexisting allergies, and fatigue.

EIB is more common in athletes who engage in sports that place a constant, high-level demand on the respiratory system, including distance running, cycling, soccer, and Nordic skiing. Swimming represents an exception: although it places significant demands upon the aerobic system, it takes place in a moist air environment. Anaerobic sports such as field events in athletics, boxing, tennis, volleyball and American football, in which the demands on the respiratory system are often intense but intermittent, place less stress on an asthmatic's airways. There is also a strong relationship between the occurrence of bronchospasm and the intensity of the activity: the more intense the training or competition, the greater the likelihood of EIB.

In some aerobic sport athletes, it has been observed that the athlete has been able to "run through" the asthma attack; the body's production of the natural hormone epinephrine is believed to assist in the lessening of bronchospasm during endurance activities.

Asthma is an episodic illness, and its attacks can vary in their severity from mild to acute. As a preventative, asthmatic athletes can follow several different precautions. They might use medication inhaled through a bronchodilator, known as a puffer. Such medications are typically a form of anti-inflammatory known as a corticosteroid; they are intended to reduce airway inflammation. It is also recommended that the asthmatic athletes indulge in longer low-intensity warm-ups, to lessen the risk of an EIB episode; they should also do a longer, similarly low-intensity cool down.

While exercise-induced asthma must be considered a serious condition by the athlete, coaches, and parents, it is not a barrier to elite level athletic participation. Both Joan Benoit Samuelson, the first Olympic women's marathon champion, and Jackie Joyner Kersee, a double Olympic gold medalist, are asthmatic