

THE "INFO"-HALER



TAKE IN THE INFORMATION

An easy to understand, informative newsletter for our patients of all ages from the
Allergy & Asthma Associates of Michigan, P.C.

WHAT IS ASTHMA?

Asthma is a chronic respiratory condition characterized by a temporary obstruction or blockage of the airways. Its exact cause is unknown, though it tends to be hereditary in two-thirds of all cases. It affects more than twenty million adults and nine million children. It is one of the leading causes of school and work absences. There is no cure. It is, however, very controllable and reversible. Asthma symptoms include shortness of breath, wheezing, coughing, mucoid sputum production, and chest tightness. Asthma patients require ongoing medical care to control symptoms and prevent recurrent asthma attacks.

To best understand asthma, it is important to know how the respiratory system works. The air we breathe in via the nose and mouth passes through the windpipe (trachea) then goes into two large air tubes (bronchi), one for each lung. The bronchi then branch out within the lungs into smaller air tubes (bronchioles) which lead to tiny air sacs (alveoli) where the exchange of oxygen and carbon dioxide takes place. The entire respiratory system resembles an upside down tree, the trachea being the trunk, and the bronchioles/alveoli the tiniest tree branches.

The walls of the bronchi are almost entirely made of smooth muscle which maintain the size and shape of the airway. The muscle works by reflex and is controlled by the central nervous system. A person has little conscious control over the tightening and relaxing of these muscles. The bronchiole wall is coated with a thin layer of mucous and tiny hairlike projections called cilia. The mucous cleans the air we breathe by trapping small foreign particles such as dust. The cilia then move the mucous entrapped particles toward the throat where they are either swallowed or coughed up. During normal breathing the bronchiole muscles are relaxed and the air tubes are open.

Patients with asthma may or may not have allergies, and patients with allergies may or may not have asthma, though the two conditions are often found together. Asthma also does not cause emphysema. Emphysema is a permanent, irreversible disease of the alveoli (air sacs) of the lung. Emphysema is primarily caused by cigarette smoking. In emphysema there is permanent destruction of the air sacs which impairs the normal exchange of oxygen and carbon dioxide in the lungs. Asthma, on the other hand, is a reversible disease of the bronchiole tubes.

Asthma is caused by a combination of three factors. The first factor is spasm of the muscles that surround the air tubes. In an asthmatic patient, the muscles that line the airways are "oversensitive", "twitchy", and "spastic." When triggered (by an allergen, cold air, exercise, inhaled or ingested substances, viral infections, etc.) they go into spasm and contract causing the air tubes to constrict. As these airways constrict, breathing becomes more difficult and a wheezing sound or coughing occurs, the result of trying to force air through blocked air tubes.

The second factor that causes asthma is inflammation and swelling of the lining of the bronchiole tubes. When the air tubes become "spastic", they begin to ooze a fluid that contains many white blood cells to fight off infection. These white blood cells release chemical substances called prostaglandins that further irritate the bronchiole walls and cause them to become inflamed and swollen.

Thirdly, there is an increase in mucous production. Everyone has mucous producing cells called "goblet" cells whether they are asthmatic or not. The mucous normally lubricates the airways to allow air to flow smoothly, and

transports enzymes and chemicals to help fight off infection. Asthmatics, however, have an abundance of these "goblet" cells which produce excessive amounts of mucous. This increased mucous serves as a sticky plug to further clog the small remaining space through which air must travel.

During an asthma attack, the patient finds it extremely difficult to breathe and must seek medical attention immediately. An asthma attack generally occurs in two stages. The first stage consists of the immediate symptoms such as coughing, wheezing, and shortness of breath. It usually peaks within thirty minutes to one hour of the onset of the attack, and subsides within two hours. It is followed, however, by a late phase characterized by persistent inflammation and narrowing of the airways. The late phase begins three to four hours after the initial attack, and may last a few hours or several days depending on the severity of the attack. Treatment consists of bronchodilators immediately to relax airway muscles, and then corticosteroids to decrease existing swelling and prevent further swelling.

Asthma, once again, is a very controllable and reversible disease. Between bouts of symptoms, pulmonary function and airway size virtually always returns to normal. Treatment of asthma is directed toward symptomatic relief of attacks, control of the causative agents via avoidance measures, immunotherapy, preventative medications, and maintenance of optimum health.

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