Breathing Easy: Controlling Asthma Triggers

Mike Bradshaw
Extension Specialist, Health and Safety

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

What is asthma?

Asthma is a chronic condition that occurs when the air passages of the lungs and bronchial tubes become swollen, irritated and inflamed. The muscles of the bronchial walls tighten causing airways to narrow. This can lead to conditions from minor wheezing to severe breathing difficulty. In some cases, breathing becomes so labored that the attack becomes life threatening.

How serious is asthma?

The National Heart, Lung, and Blood Institute reports that about 17 million people in the United States have asthma and of these, 5 million are children. Every year, asthma causes roughly 2 million emergency room visits with more than 500,000 hospitalizations and 4,500 deaths. Asthma-related deaths vary substantially by age group with the elderly having the highest death rate.

What causes asthma?

While little is known about the factors that influence asthma's development, we have a good understanding of the agents that contribute to the reoccurring attacks once the person has the disease. Airway inflammation is caused from a reaction to viral infections like the common cold or inflammation from being predisposed to allergies. The immune system development seems to be key as to whether or not a person develops asthma from being predisposed to allergies. Scientists believe that genetic factors characterized by the production of certain types of antibodies make a person more susceptible. This genetic factor determines whether a person will produce the type of antibodies that are most associated with the allergic response that triggers asthma.

A person with hay fever may have red, weepy eyes and an itchy nose from the inflammation caused by an allergen. The person who has lungs sensitized to allergens may have tissue swelling of the lungs, which sets up contraction of bronchial tubes. This contraction of the muscles of the bronchial tubes reduces airflow and causes breathing difficulty.

Scientists describe a person's genetically inherited susceptibility to becoming allergic as the most important predictor of a person developing asthma. If neither parent has asthma, a child has less than a 10 percent chance of developing the disease. When one parent has asthma, the chance rises to 25 percent; and when both parents have the disease, the child has a 50 percent chance.

Those who experience asthma associated with a cold that occurs from time to time are classified as intermittent. They are the group of asthmatics who we say grow out of the disease. They do not seem to be bothered by asthma as they grow older.

Those having symptoms at least twice a week during the day or twice a month during the night are classified as persistent. These asthmatics are classified further as mild, moderate, or severe. The mild, moderate, or severe classifications help the physician determine the type of treatment for the person. Regardless of the type of persistent asthma, the person should be on a treatment schedule. Persistent asthma cannot be cured, but most people can manage their condition with a careful treatment plan.

Family history is one of the best indicators in determining if a child's asthma will persist (long term). The disease is likely to persist in those whose asthma is triggered by environmental allergens, tobacco smoke, exercise, seasonal changes, and who experience wheezing at night. They also may have other allergic symptoms such as allergic rhinitis or eczema (an itchy skin condition).

Asthma Triggers

Environmental substances and conditions, which lead to the actual onset of asthma, are called asthma triggers. Indoor- and outdoor-inhaled allergens are some of the most common irritants that induce asthma. Household dust mites, cockroaches, dander from furred or feathered animals, fungi, and pollens are common allergens.

Other substances and conditions that can cause an asthma attack may include tobacco smoke, industrial emissions, vehicle exhaust, ozone, sulfur dioxide, some foods, food additives, and smog. Respiratory infections, exercise, hyperventilation, stress, and fear also can trigger an asthma attack.

In adults, the symptoms of asthma are less likely to be triggered by allergen such as dust mites, pet dander, and pollen. Symptoms are more likely to be triggered by flu, colds, or other viral infections. Exercise, excitement, depression, anxiety, medications, cigarette smoke, cold air, perfumes, and chemical fumes also may trigger an attack.

Who is most likely to develop the disease?

Scientists have identified factors that may increase a person's chance of developing asthma. As you would expect, these factors are closely related to some of the asthma triggers above. These include:

- Living in an urban area of a large city, where there is exposure to many environmental pollutants
- Exposure to secondhand smoke
- Exposure to chemicals in paint, steel, plastics, and farm operations
- Having one or both parents who have asthma
- A number of respiratory infections in childhood
- Low birth weight
- Obesity
- Reflux disease
- Have allergies.

Treatment

Asthma is treatable. Asthma attacks and deaths can be prevented. New drugs and self-management plans have reduced the number of deaths and trips to hospital emergency rooms. When parents, patients, and doctors work together to develop a plan, the risks of severity and possible death decrease significantly.

There are two main categories of drugs used for asthma patients. Short-term (quick-relief) medications that relieve asthma symptoms and long-term controller medications that are used every day by people with persistent asthma.

Who should go on long-term medication?

The rule of two is used to determine who should control their asthma with long-term medication. People who use the quick-relief asthma medicine more than two times a week, wake up with asthma more than two times a month, or have to refill their quick-relief inhaler more than two times a year should consider using the long-term controller medications. The purpose of long-term medication is to control or reduce the chronic inflammatory changes in the lungs and avoid permanent damage to the lungs.

Long-term Preventive Medications

Corticosteroids (which are anti-inflammatory medicines) inhaled, deliver medicated relief directly to airways and have fewer side effects. The long-acting beta2-agonist medications can help prevent attacks for patients with persistent asthma and prevent symptoms on a long-term basis.

Leukotrien inhibitors also reduce the inflammation of asthma and are effective in some patients. Antihistamines are also used. In some difficult cases, the patient may take two types of inhalers and two to three other oral medications.

Quick-Relief Medications

The quick-relief medications immediately relieve the discomfort of chest tightness, coughing, and wheezing. Short-term relief medications relax muscles surrounding the airways. Other short-term relief medications relieve the inflammation or swelling in the airway. Medications are taken with an inhaler, syrup form, or tablets. Quick relief medicines include the short-acting bronchodilators, which may be all that is necessary to treat people with mild, intermittent asthma.

Preventing an Asthma Attack

Many physicians believe that a well-educated and conscientious patient can be effective in keeping symptoms under control. Knowing that inflammation in the lungs can be there without symptoms of disease also is helpful. Many patients use a peak flow meter to measure how well the lungs are functioning. The meter measures how well lungs are able to expel air. The simple device is used to monitor how well the lungs are functioning although no symptoms are present. The faithful monitoring of the lung capacity is all that some need to keep asthma attacks from occurring. Other suggestions to prevent an asthma attack include:

- Develop a plan with a physician.
- Treat attacks early.
- Use air conditioning to reduce environmental allergens. Air conditioning decreases humidity and reduces dust mite exposure.
- Maintain 40 to 50 percent humidity in the home.
- Encase pillows, mattresses, and box springs in washable dust-proof covers.
- Wash bedding once a week in hot water.
- Replace synthetic pillows every two to three years.
- Replace bedding with synthetic material such as Dacron.
- Change air filters according to manufacturer instructions. Consider using a small-particle filter in ventilation system.
- Reduce pet dander. Regularly bathe pets. Avoid pets with fur or feathers.
- Clean your home once a week. Wear a dust mask while cleaning because it stirs up particles.
- Wear eyeglasses, not contacts, when pollen count is high. Otherwise, pollen particles can get underneath contact lenses.

Appreciation is expressed to:

Carmen Eichman for her written contribution

Reviewed by
James Gardner, M.D., Primary Care Physicians of Manhattan
Sharolyn Flaming Jackson, Riley County Extension
Linda Coffman, Shawnee County Extension

Resources for Parents:

1. American Academy of Allergy, Asthma, and Immunology
   611 East Wells Street
   Milwaukee, WI 53202
   (800) 822-ASTHMA or (414) 272-6071
   Internet: www.aaaai.org

2. Center for Disease Control and Prevention, National Center for Environmental Health, Air Pollution and Respiratory Health Branch:
   www.cdc.gov/nceh/airpollution/asthma/

3. National Institutes of Health, National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program:
   www.nhlbi.nih.gov/about/naepp/index.htm

4. American Lung Association (ALA)
   www.lungusa.org

5. Asthma & Allergy Foundation of America (AAFA)
   www.aafa.org

Kansas State University Agricultural Experiment Station and Cooperative Extension Service , Manhattan, Kansas

MF-2597 August 2003