

Pediatric Asthma

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What is Asthma?

Asthma is a condition that affects an individual's respiratory system. In individuals with asthma, their airways become inflamed and constrict, filling with mucus. Resultantly, it becomes increasingly hard to breathe. Individuals may start coughing or wheezing as the airways continue to constrict. Although asthma is a chronic condition, its symptoms can be controlled. For most people, asthma does not necessarily interfere with daily life. However, when unmanaged, potentially life-threatening asthma attacks can occur. Asthma can affect people of all ages and it tends to be a genetic condition.

Asthma in Children

Approximately 8.4% (6 million) of children in the US are affected by asthma. While there are multiple types of asthma, allergy-induced asthma is the most common in children. Upon exposure to common allergens such as pollen, dust, mold, or pets, an asthmatic reaction will occur. Other types of asthma include exercise-induced asthma, in which physical activity and strain can induce an asthmatic reaction, and virus-induced asthma, where illnesses such as a cold or the flu can produce a reaction. Other triggers include air pollutants, such as tobacco smoke, and weather changes. Children can have one sole trigger for asthma or overlapping triggers, such as physical activity and pollen. Most children will begin experiencing symptoms of asthma by age 5, however, it can develop at any point and tends to be more prevalent in boys.

Symptoms of Asthma

Symptoms of asthma primarily present as respiratory symptoms such as:

- Frequent coughing that gets worse when triggered by allergies, exercise, or viruses
- Whistling or wheezing when breathing out
- Shortness of breath
- Chest tightness
- Trouble sleeping
- Loud and heavy breathing

Risk Factors of Asthma

There are certain factors that may increase a child's likelihood of developing asthma. They include:

- Exposure to secondhand smoke
- Family history of asthma
- History of allergies and/or eczema
- Obesity
- Respiratory conditions such as chronic nasal congestion

- Heartburn

Diagnosis of Asthma

Asthma can be difficult to diagnose, as the symptoms frequently overlap with other conditions such as GERD, nasal congestion, and varying respiratory viruses. However, there are two diagnostic tests that are given to diagnose asthma: spirometry testing and exhaled nitric oxide testing. These tests are non-invasive, requiring individuals to take a deep breath and blow into a tube. Both of these tests are only accurate after the age of 5 and any diagnosis of asthma before that will be solely based on symptoms. Spirometry testing measures an individual's FVC (forced vital capacity) and FEV1. FVC is the greatest amount of air that one can exhale after taking a deep breath in and FEV1 is the amount of air that one can push out in one second. An FVC and FEV1 result of less than 80% is an indication of asthma. If spirometry testing comes back inconclusive, a physician may order an exhaled nitric oxide test. This test measures the amount of nitric oxide that is expelled in one breath. High levels of nitric oxide indicate airway inflammation, a main symptom of asthma. When diagnosing asthma in children, physicians may also choose to do other tests to rule out any conditions that are often associated with asthma. Tests include chest x-rays, allergy skin testing, and pH monitoring, which aim to determine if GERD or allergies are causing or contributing to the asthma.

Treatment of Asthma

Treatment for asthma consists of both preventing symptoms and treating an asthma attack while it is occurring. For long-term treatment of asthma, corticosteroid inhalers are the best treatment. Also common are combination inhalers of corticosteroid and a long-acting beta antagonist (LABA). There are also oral long-term medications, leukotriene modifiers and theophylline. It is imperative that these medications are taken daily in order to control the inflammation of the airways, as they decrease the chances of having a severe asthma attack. Symptom relief, however, may take several days to begin. Quick relief medications such as albuterol inhalers and oral or intravenous corticosteroids are used when an asthma attack is occurring. These medications take action within minutes to reduce inflammation, opening airways. For allergy-induced asthma, immunotherapy, Xolair shots, and allergy medications such as nasal decongestants can work to lessen symptoms of asthma and allergies at the same time. It is important that parents work with their children's doctors to create an action plan for if an asthma attack occurs to get their child's breathing under control as quickly as possible. Parents can also control environmental factors that contribute to their children's asthma. Examples include maintaining a low humidity home environment, routinely getting the air conditioning unit cleaned, keeping the house free of dust to name a few. It is also very common for children to outgrow their asthma with time, however maintaining asthma check-ups remains important throughout life.

References

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