Mass General Brigham

Pamphlet #14: Do I Have Asthma or COPD?

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Asthma and chronic obstructive pulmonary disease (COPD) are both very common lung diseases, and they often have many overlapping features, such as cough, shortness of breath, and occasional whistling breathing (wheezing). We think of these as two distinct disorders, but they can sometimes be difficult to distinguish; and it is possible for the two conditions to co-exist in one person. In this pamphlet we will try to clarify 4 different conditions: asthma, COPD, asthma-COPD overlap, and chronic obstructive asthma.

Asthma

Asthma is a disease that typically begins in early childhood and is often seen in individuals who have other allergic diseases, such as seasonal nasal and ocular allergies like "hay fever," eczema, or hives. It has a large inherited component, and consequently it is often found in other family members. Asthma is characterized by excess "twitchiness" of the breathing tubes (the bronchial tubes), with a tendency for these tubes to contract and narrow in response to characteristic stimuli or "triggers," often (though not always) including allergens that are breathed in, such as from cats, dogs, mold, dust, pollens, etc. The narrowing of the bronchial tubes comes and goes, and so symptoms are typically episodic. Some days your breathing is perfectly normal, other days it is difficult to walk or sleep because of cough, chest tightness, and shortness of breath. The narrowing of the breathing tubes is said to be "reversible"; it typically gets better quickly in response to medications. This reversibility can be demonstrated with breathing tests. If the bronchial tubes are narrowed and the flow of air through the tubes is reduced, a repeat test following administration of a bronchodilator like albuterol will typically show marked improvement, often back to normal. In asthma the fabric of the lung tissue, made up of millions of tiny air sacs called alveoli, is normal.

COPD

In contrast, COPD can cause changes in both the lung tissues and the airways. In the vast majority of cases, it is the result of many years of cigarette smoking. Inhalation of cigarette smoke causes a non-allergic inflammation of the bronchial tubes ("chronic bronchitis") that mimics asthmatic inflammation of the bronchial tubes in many ways and is often treated with many of the same inhaled medications. Recently, it has been found that some persons with COPD and excess eosinophils in their blood may benefit from treatment with anti-eosinophil "biologics," just as in asthma.

At the same time, long-term cigarette smoke inhalation weakens the walls of the air sacs ("alveoli") deep in the lungs, causing them to enlarge and to lose their elasticity. Behaving like an old rubber band that has lost its springiness, the lungs with this sort of damage to the air sacs (the part of COPD that is called "emphysema") cannot empty the air out as fast as normal. And bronchodilators, which act on the breathing tubes, do not affect this loss of elasticity. As a result, the difficulty breathing in COPD is largely permanent and generally changes little when breathing is measured before and after administration of a bronchodilator. The injury to the lungs in COPD is irreversible; the lungs can never return to normal.

Unlike asthma, COPD generally begins in middle-age or older. Persons with COPD are not prone to the effects of allergic triggers, but their breathing can be made worse by non-specific irritants like smoke, air pollution, and dusty environments. Emphysematous damage to the lungs can be seen on a chest CT scan and sometimes even on a plain chest X-ray.

Given the choice, most persons would rather be told that their breathing difficulty is due to asthma rather than COPD. There is a stigma of self-inflicted injury around a diagnosis of COPD; and for some people "emphysema" mistakenly conjures up a distorted image of only very advanced disease, wheelchair-bound and dependent on breathing supplemental oxygen. As a result, there is often a bias toward seeking/giving a diagnosis of asthma rather than COPD.

Distinguishing Features	**Asthma**	**COPD**
Age of onset	Most often in childhood	Middle-age or older
Sensitive to allergens	Frequent	No
Runs in families	Often	Infrequently
Involves damage to the alveoli ("emphysema")	No	Yes
Sometimes breathing returns to normal	Yes	No

Asthma-COPD Overlap

Is it possible to have both asthma and COPD? The short answer is yes, because persons with asthma may also smoke cigarettes. By some estimates, 20-30% of persons with asthma are or have been smokers, similar to the general population. One would not be surprised to find that, after decades of cigarette smoking, persons with asthma can develop persistent, irreversible airflow obstruction on pulmonary function testing. Even on a good day, when their asthma is under perfect control, they have reduced breathing capacity.

Likewise, asthma and allergies sometimes develop later in life, in early or even late adulthood. Having COPD does not protect one from developing allergic disease later in life. The new onset of asthma and allergies can happen in persons who have smoked cigarettes for many years and have already developed COPD. Now their breathing can be made worse, as in asthma, by

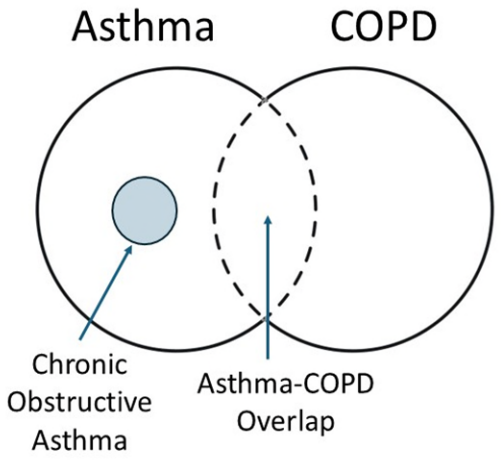
exposure to inhaled allergens, exercise on a cold day, etc., and it can vary widely from day to day.

The two groups of persons described here may be considered as having combined asthma and COPD, or what has been termed "Asthma-COPD Overlap." A considerable amount of research is being devoted to better understand how asthma-COPD overlap differs from pure asthma and from pure COPD and how it is best treated.

Chronic Obstructive Asthma

Remember that the "obstructive" in "Chronic Obstructive Pulmonary Disease" or COPD refers to "obstruction" or slowing of the flow of air out of the lungs. In asthma this obstruction to the flow of air comes and goes; in COPD it may vary somewhat but it is overall permanent and irreversible. In asthma-COPD overlap, there is both a permanent/irreversible component from cigarette smoking and a variable component from asthma.

Does asthma ever turn into COPD? No. Asthma does not evolve over time into emphysema and chronic bronchitis, the components of COPD. But is it possible that someone with asthma who smoked cigarettes minimally or never at all might find that even when treated with the best possible therapy and feeling well, they have some component of limited breathing capacity – irreversible obstruction to the flow of air from their lungs? The answer is "yes." Although there is debate as to how best to label this condition, we consider "chronic obstructive asthma" (meaning asthma with a component of irreversible airflow obstruction) to be the best terminology.



We know little about why some people with asthma develop chronic obstructive asthma. Perhaps they had childhood disease that prevented growth of their lungs to normal. Perhaps they have had severe, long-standing inflammation of their bronchial tubes that led to permanent scarring. In truth, we know little about what causes chronic obstructive

asthma, how often it occurs, and what exactly are the changes in the lungs that result in its permanent, irreversible airway narrowing.

You will want to discuss how best to manage your asthma, asthma-COPD overlap, or chronic obstructive asthma with your medical provider and asthma specialist. We can advise the following with certainty: don't smoke (or vape) and get vaccinated against preventable respiratory infections, such as influenza, COVID-19, respiratory syncytial virus (age 50 years and older), and pneumococcal pneumonia.