Is COPD Hereditary?

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Is COPD Hereditary? – Are You at Risk?

About 15.7 Americans have chronic pulmonary disease (COPD), according to the Centers for Disease Control and Prevention. Most of these people have both chronic bronchitis and emphysema.

Do Genetics Play a Role?

Most of the time COPD is not hereditary. The most common risk factors for COPD are tobacco smoke and chemical fumes.

Some people have an inherited condition called alpha-1 antitrypsin deficiency where there is improper DNA coding to make the alpha-1 antitrypsin protein.

The alpha-1 antitrypsin protein protects the body against certain enzymes, but without enough of this protein, destructive enzymes attack the body's tissues, especially the lungs. Tobacco smoke and chemical exposures make alpha-1 antitrypsin deficiency worse.

Since the discovery of the alpha-1 antitrypsin protein back in the 1960s, researchers have identified new genes that play a role in COPD development. However, there is still a lot about genetic foundations to learn.

Recently, researchers from Brigham and Women's Hospital were able to designate 13 new genetic areas related to COPD, including four that were not previously associated with lung function. This new discovery is significant because it confirms a genetic link and brings with it a potential for new and advanced treatment options.

Alpha-1 Antitrypsin Deficiency

Alpha-1 antitrypsin deficiency (AATD) is common in 1 out of 2,500 of people and mostly those with European ancestry, this according to The National Human Genome Research Institute. Interestingly, it is uncommon among people of Asian descent.

AATD is an inherited condition that causes lung disease, including COPD. People with this condition usually start having symptoms between ages 20 and 50.

It is likely most people with AATD are undiagnosed even those who have been diagnosed with COPD. Some individuals with AATD are mistakenly diagnosed with asthma.

The earliest symptoms of AATD include:

- Shortness of breath with mild activity
- Inability to exercise

- Wheezing
- Intentional weight loss
- Reoccurring respiratory infections
- Fatigue
- Rapid heartbeat

People who inherit AATD must have two copies of the defective gene, one from each parent. If you only inherit one faulty gene, you become a carrier, which means you won't have AATD but you can pass the gene on to your children.

If you have AATD, the best way to prevent COPD and other lung conditions is not to smoke. You should also avoid secondhand smoke and chemical fume and mineral dust exposure.

Once you are diagnosed with AATD, your doctor will give you alpha-1 antitrypsin protein replacement shot to keep your levels normal and to keep certain enzymes from attacking inflamed lung tissue.

Smoking and COPD Risk

Smoking is the biggest risk factor for COPD. The Centers for Disease Control and Prevention report that smoking contributes to 80 percent of COPD deaths.

Smoking during teen and childhood years slows lung development and increases the risk of developing COPD in adulthood. The earlier you start and the longer you smoke, the more likely you will likely get COPD.

But the sooner you quit smoking; you increase your odds of prevention. If you already have COPD, quitting smoking will slow down the disease's progression and minimize breathing problems and other COPD symptoms.

Tobacco use and AATD

If you have AATD, you should not smoke. Smokers are more likely to develop symptoms of AATD and other conditions, including COPD.

In smokers, symptoms of AATD start at an earlier age and progress quickly. You should also avoid second-second smoking if you have AATD.

Other Risk Factors

While smoking is the biggest risk factor for COPD, it is not the only one. In fact, you don't have to be a smoker to develop COPD.

COPD is common in areas where people cook and heat homes with burning fuel.

You can also develop COPD if you are exposed to:

- Air pollution
- Mineral Dust
- Chemical fumes
- Gas fumes

People with AATD should avoid exposure to pollution, mineral dust, and gas and chemical fumes. If your job requires you to be around these irritants, make sure you are wearing a face mask and/or other protective occupational hazard gear.

Outcomes for People with AATD

The prognosis for people with AATD depends on the nature and severity of symptoms they experience. For many, AATD shortens their lives and having another lung condition, such as COPD, puts them at further risk for health complications.

Smokers with AATD and COPD develop more severe and rapid lung damage that starts earlier in life. Non-smokers with both AATD and COPD may have a normal lifespan and may likely avoid lung complications.

COPD is a progressive disease and gets worse over time, and the sooner you take necessary steps to protect your lungs, the less damage COPD will cause, even with AATD.

Now that researchers know there are additional genes associated with COPD, it is even more important to protect yourself from all the risk factors. Hopefully, the future of genetic COPD research brings more insight into the basic genetics of COPD and conditions, like AATD, which increase the risk for COPD and pave the way towards more preventative strategies and treatments.