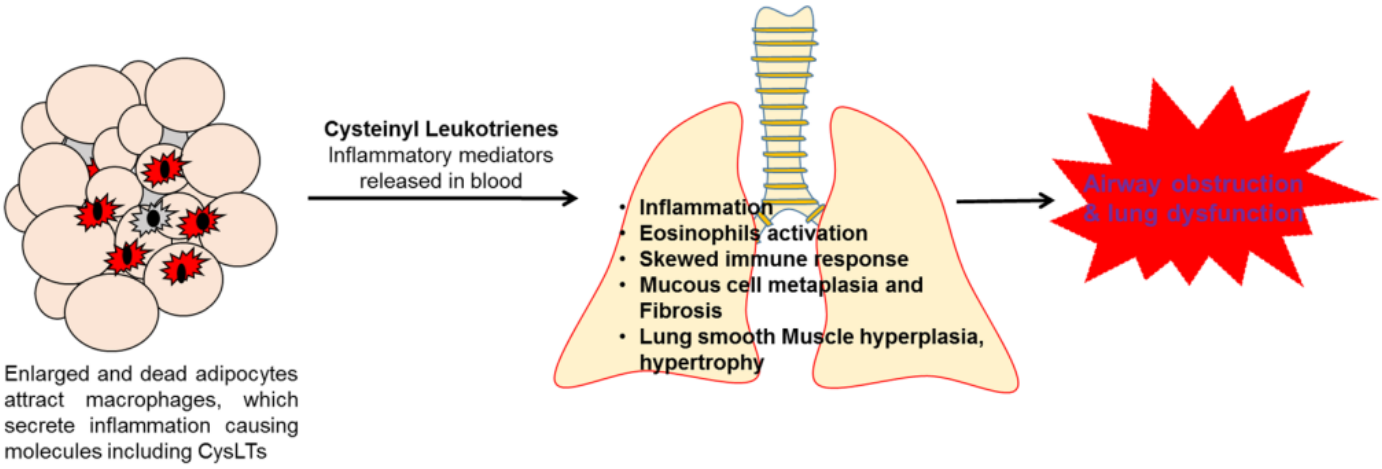
Obesity causes lung dysfunction and breathing troubles by increased cysteinyl leukotrienes pathway

Increased body weight is a chronic health problem which has emanated from the globalized food market and dietary habit. This has led to the different types of ailments which occur in obese individual simultaneously and referred to as metabolic disorders. Metabolic syndrome includes conditions such as obesity, insulin-resistance, diabetes, hypertension, cardiovascular, and some forms of cancers. Lung dysfunction is also associated with increased body weight in which obese persons feel difficulty in breathing and could develop asthma like symptoms if not treated timely. Many studies have shown that such patients are difficult to treat with the regular asthma medicines, which suggests that probably breathing problem in obese people is caused by different mechanism and is different than allergic asthma. Elevated levels of cysteinyl leukotrienes (CysLTs) in the urine of obese asthma patients indicate elevated levels of biochemical pathway that forms this compound. CysLTs are responsible for the inflammation and swelling and can change the cell's behavior by modifying their structure and function. In fact, LTs are known to cause lung problems in asthma and COPD in non-obese people and inhibitors of LTs receptors or of enzymes that make LTs are used as drug to treat such patients.



Mechanisms of Obesity-induced inflammation and Lung-dysfunction

In the obese individual the fat deposits in the special cells called adipocytes which grows in number and size upon energy rich diet consumption. The adipocytes secret certain chemicals which attract macrophages, the policing cells in body which fight with pathogens and infectious agents and also some of the body's own molecules and materials and removes them. In excessive accumulation of adipocytes, more macrophages get attracted to adipose tissue, get overactive and secrete molecules like cytokines, chemokines and also CysLTs which are released in blood and can cause

inflammation in other body parts.

When it reaches to the lungs, CysLTs can activate the lung cells which can also secret the inflammation causing molecules and attract immune cells to the lungs. This scenario is similar to the early stage of development of asthma. Over the period of time these molecules can change the structure and function of lung cells including epithelial cells which can change into either mucous cells of fibrous cells and lung function may get severely affected. Mucous cells secret large amount of mucous which inhibit the gas exchange in the lung while fibrous cells affect the elasticity of the lung and lung cannot expand upon breathing.

How obesity causes these changes in the lungs is still not known and scientists are actively working to find answers. The mechanism once clear can help in treating such patients using the appropriate drugs.

Publication

Cysteinyl Leukotrienes (CysLTs): Role in Obesity-Induced Asthma.
Yadav UC, Srivastava SK
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