Smokers undergo the same changes in gene expression as patients with COPD

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'Healthy' smokers experience changes in the gene expression of their lungs similar to that suffered by smokers who have developed Chronic Obstructive Pulmonary Disease (COPD). This is the conclusion of a new study, led by Catalan researchers, which confirms the crucial role that smoking plays in causing these alterations.

"Our objective was to analyse the expression of a range of genes in the pulmonary tissue samples of patients with COPD, whether smokers or not, and people who had undergone operations for cancer or lung transplants", Ricardo Bastos, lead author of the study and a researcher at the August Pi i Sunyer Biomedical Research Institute (IDIBAPS), tells SINC.

Using the real-time polymerase chain reaction (PCR) technique, the scientists analysed the expression of 42 genes related with processes such as tissue and vascular inflammation and change. Previous data already existed on the involvement of some of the proteins that code these genes in causing and developing the disease.

The authors then compared the expression profile of these genes between patients with moderate and severe COPD, 'healthy' smokers with normal lung function, and non-smokers. The main result of these studies was that the gene expression profile in the patients with moderate COPD was very similar to that of the 'healthy' smokers.

"The 'healthy' smokers experience similar gene expression changes as those seen in smokers who have developed the disease", concludes Bastos. "This once again underlines the decisive role of smoking in causing these changes".

In fact, these two groups have a more similar gene expression profile than patients with moderate and severe COPD. Previous laboratory studies have shown that the structural and cellular lung changes (to the airways and pulmonary arteries) of 'healthy' smokers are very similar to those in smokers with slight or moderate COPD.

The world's fourth leading cause of death

COPD is characterised by limited air flow, which is progressive and irreversible, caused by an abnormal inflammatory response in the lung, which at advanced stages can lead to the patient's death. All current treatments are merely symptomatic and palliative. Experts insist on the need to develop new therapies to help slow down the progression of the disease.

It is the most common respiratory disease caused by smoking - which is the most important risk factor. It has high prevalence and mortality rates in industrialised and developing countries. Forecasts issued by the World Health Organisation (WHO) suggest that COPD will become the world's fourth leading cause of death (it is currently the sixth) by 2020.

More information: Laia Llinàs, Víctor I. Peinado, J. Ramón Goñi, Roberto Rabinovich, Sandra Pizarro, Robert Rodríguez-Roisin, Joan Albert

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