

A study shows that patients with COPD do not show muscular destruction until very advanced stages of the disease

- The results indicate that it is essential for patients suffering from moderate COPD to continue exercising their muscles, even in advanced stages of the disease, to maintain a good quality of life.

A team of researchers from the Hospital del Mar and its Research Institute, IMIM, as well as from CIBER for Respiratory Diseases (CIBERES) – Carlos III Health Institute – Ministry of Science and Innovation- has lead a study proving that patients with severe COPD do not present muscular destruction until very advanced stages of the disease, especially when they still maintain a good muscle mass. This could lead to the deduction that exercising is not only possible, but also advisable. The results of this study have been published in the latest issue of the Journal of Applied Physiology.

Until now it had been observed that patients suffering from chronic obstructive pulmonary disease (COPD) in its more advanced stages with a considerable loss of muscle mass also presented, in their tissues, high levels of programmed cell death (apoptosis). However, it was yet to be seen whether patients who did not show a loss of muscle mass, in the cases of COPD predominant in Spain, also presented apoptosis. This team of researchers from the Hospital del Mar – IMIM- has taken a step forwards. These researchers are now in the position to give an answer to this question –“*In intermediate cases of this disease, when there is no loss of muscle mass, we have seen no indication of muscle destruction, nor advanced signs of apoptosis*”, explains Dr. Esther Barreiro, a pulmonologist from the Hospital del Mar and researcher at CIBERES who has lead this team of researchers.

To carry out this study three groups were put together: patients with moderate and severe COPD and a group of control subjects. It was observed whether or not there was cell swelling in three muscles: the external intercostals muscles, the diaphragm and the quadriceps. It was also observed whether or not they presented apoptosis. Biopsy samples were obtained of the respiratory muscles and of the lower limbs from each patient and they were analyzed using four apoptosis markers. “*A first marker was caspase, a group of proteins used to measure apoptosis, observed both with a histological preparation and at a molecular level. Another marker is based on*

For further information: www.parcdesalutmar.cat

Communications Service | Passeig Marítim 25-29 | 08003 Barcelona | Tel. +34 93 248 30 72 |
Tel. +34 93 248 34 15 | Tel. +34 93 316 07 07
Margarida Mas (+34 626 523 034).

determining DNA rupture" –says Dr. Barreiro. "When there is apoptosis this marker is increased because DNA is being destroyed and the marker detects the filaments of the double helix resulting from this rupture. And the third marker is what we call the Golden Standard, which is electron microscopy, the reference technique for all pathologists", concludes Dr. Barreiro, head of the research team on molecule mechanisms for predisposition of lung cancer at IMIM. After studying the nuclei of all the preparations obtained, it was discovered that there was no difference between the number of nuclei presenting apoptosis in the respiratory and peripheral muscles in patients with severe COPD compared to the control group. "This means that suffering from COPD is not necessarily a conditioning factor for a greater muscle destruction", explains Dr. Esther Barreiro. None of the markers showed any clear difference in any of the three studied groups except for one of them – the tunnel of both respiratory muscles and the quadriceps. "We have reached the conclusion that there could be a certain degree of apoptosis, but what we really believe is that there is a mechanism of cell reparation", points out Dr. Barreiro.

Chronic Obstructive Pulmonary Disease (COPD) is characterized by a progressive chronic limitation of air flow, which is generally irreversible, caused by tobacco consumption in 90% of cases. The symptoms of this disease are a decrease in respiratory capacity which leads to a drop in the patient's quality of life. In Spain this affects around 10% of the population and, each year, 18,000 people die from this disease. It is the only tobacco-related disease where mortality rates are actually increasing. In our environment, the prevalence of COPD is still more frequent in male patients than in female ones, given that males have been smoking for longer than females, even if this trend will change relatively soon since, today, there are more young female smokers than male smokers of the same age.

For further information: www.parcdesalutmar.cat

Communications Service | Passeig Marítim 25-29 | 08003 Barcelona | Tel. +34 93 248 30 72 |
Tel. +34 93 248 34 15 | Tel. +34 93 316 07 07
Margarida Mas (+34 626 523 034).