

Some treatments for osteoporosis could reduce the incidence of COVID-19

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Dr. Josep Blanch-Rubió (left) and Jordi Monfort (right).
Credit: Hospital del Mar.

Some of the principal treatments for osteoporosis—denosumab, zoledronate and calcium—could have a protective effect against COVID-19 in patients who take them, specifically a 30 to 40% reduction in the rate of infection, according to the results of a joint study by Hospital del Mar, the Hospital del Mar Medical Research Institute (IMIM), Pompeu Fabra University and the Pere Virgili Health Park. The study, the first of its kind in the world, has just been published in the journal *Aging*.

The last author of the study, Dr. Jordi Monfort, head of Rheumatology at Hospital del Mar and coordinator of the Cell Research on Inflammation and Cartilage research group at Hospital del Mar-IMIM, explains that "there are indications to allow hypothesizing that certain drugs used to treat [rheumatic diseases](#) could interfere positively in the natural history of COVID-19, either by decreasing its incidence or by decreasing its progression to more serious cases." The study analyzed data from more than 2,000 patients with osteoporosis, osteoarthritis and fibromyalgia and their relationship with COVID-19 infection who are being followed up at Hospital del Mar and in the Mar Health Park healthcare sphere of influence.

The starting point was the perception by the specialists at Hospital del Mar of the low incidence of the pandemic in some of their patients. To analyze this, they worked jointly with the UPF Neuropharmacology Laboratory research group, the Hospital del Mar-IMIM Integrative Pharmacology and Systems Neuroscience research group, and physicians at the Vila Olímpica primary healthcare center (CAP). They studied the different treatments and the evolution of rheumatology patients with non-inflammatory diseases and their relation to infection by SARS-CoV-2, their evolution, need for hospitalization and mortality.

Different activation mechanisms

In the case of some of the main treatments for osteoporosis, denosumab, zoledronate and calcium, data suggest a likely major reduction in the incidence of COVID-19 in patients who take them; specifically, between 30 and 40%, according to Dr. Josep Blanch-Rubio, head of Rheumatology, first author of the study and a researcher with the Cell Research on Inflammation and Cartilage research group at Hospital del Mar-IMIM. "The study suggests that some of these treatments may protect patients against infection by COVID-19, although further studies still need to be conducted on more patients to prove it," he states.

In the case of denosumab, it targets the RANK/RANKL system involved in the balance of the skeletal system, but also the response by the immune system through the activation and differentiation of some of its cells. Its inhibition modifies the inflammatory response and acts on cytokines, which play a key role in infection by COVID-19. Zoledronate can also modulate the immune response and can stimulate its activity against SARS-CoV-2.

The results also indicate that another common treatment for these patients, the antidepressant

duloxetine, may also have a positive effect in reducing the incidence of COVID-19. Conversely, a commonly used painkiller, pregabalin, seems to have a tendency to increase the incidence of the disease. In view of these findings, Dr. Rafael Maldonado, study reference author and coordinator of the UPF Neuropharmacology Laboratory research group, suggests that "these antiosteoporotic drugs are safe and should continue to be administered to patients who take them. The promising results obtained with duloxetine are significant," while at the same time, "we conduct further studies to verify its possible beneficial effects on COVID-19."

In the same vein, Dr. Alba Gurt, a physician at the Vila Olímpica CAP of the Pere Virgili Health Park and co-author of the work, points out that "the data from the study would indicate that the antiosteoporotic treatments and duloxetine administered to our primary care patients are safe against infection by COVID-19 and could even reduce its incidence. However, studies with a higher number of patients are required to verify this."

More information: Blanch-Rubió J et al. Influence of anti-osteoporosis treatments on the incidence of COVID-19 in patients with non-inflammatory rheumatic conditions. *Aging*. 2020; 12:19923-19937. doi.org/10.18632/aging.104117

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