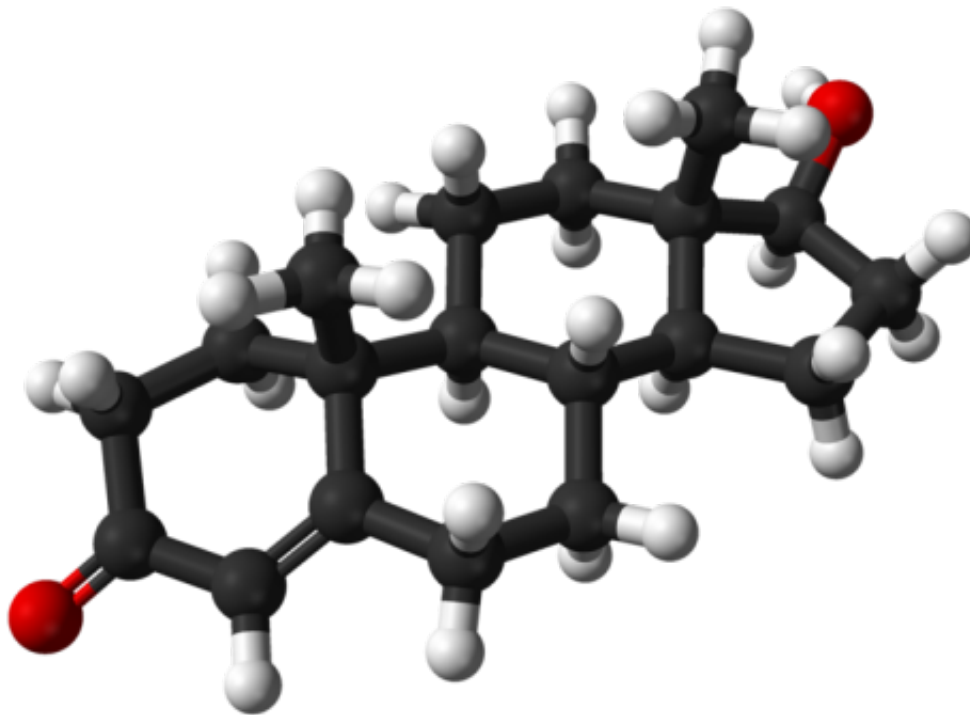


Men with low testosterone more likely to die from COVID-19

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Ball-and-stick model of the testosterone molecule, $C_{19}H_{28}O_2$, as found in the crystal structure of testosterone monohydrate. Credit: Ben Mills/Wikipedia

Men with symptomatic COVID-19, who were found to have low testosterone following admittance to hospital, were more likely to become severely ill and die from the disease, new research has shown.

The study, carried out in Milan during the first wave of coronavirus in 2020, found that the lower the levels of [testosterone](#), the higher the likelihood that [male patients](#) would need intensive care, be intubated on a ventilator and remain in hospital over a longer period. Their likelihood of dying increased six-fold.

The findings are being presented at the European Association of Urology congress, EAU21, which runs this week from July 8-12.

Professor Andrea Salonia and his colleagues at the San Raffaele University Hospital in Milan compared 286 male COVID patients, who came to the emergency department, with 305 healthy male volunteers, who attended hospital to give blood between Feb and May 2020.

The team checked both patients and volunteers for levels of male hormones, including testosterone. Testosterone is measured in nanomoles per litre (nmol/l) and 9.2 or below is deemed the threshold for low testosterone, termed hypogonadism.

Nearly 90 percent of the patients had testosterone below this level, compared to just 17 percent of the healthy volunteers. Furthermore, testosterone levels in the patients were also significantly below the threshold, averaging around 2.5 nmol/l.

Those patients who had mild symptoms or were admitted to hospital had slightly higher testosterone levels (between 3-4 nmol/l) than those admitted to ICU or those who died of the disease (just 0.7-1.0 nmol/l).

Even when age, pre-existing conditions and body mass index (BMI) were taken into account, the differences in hormonal profiles and clinical outcomes were still stark.

Professor Salonia, a specialist in urology and endocrinology at San

Raffaele Hospital, says:

"At the start of the COVID pandemic, we were seeing far more men than women coming to [hospital](#) and suffering very severe forms of the disease. We immediately thought this might be related to male hormone levels, particularly testosterone.

"But we never expected to see such a high proportion of COVID patients with these extremely low levels of testosterone, in comparison to a similar group of healthy men. The relationship is very clear: the lower the testosterone, the higher the severity of the condition and likelihood of death. I've never seen anything like it in my 25 years in the field."

Because the team does not have data on the testosterone levels in the patients before they contracted COVID-19, they cannot say whether low testosterone was a pre-existing long-term condition that exacerbated the disease or whether it was caused by the SARS-COV2 virus.

However, other research has shown that some receptors for the virus, including the enzyme TMPRSS2, are linked to male hormones and that the virus reduces the number of Leydig cells in the body, which produce testosterone

"We simply don't have the data to know which came first in these patients, the low testosterone levels or the COVID," explains Professor Salonia. "Testosterone does play a role in protecting men from disease. However, it's also possible that the virus itself is able to induce an acute reduction in [testosterone levels](#), which then predisposes these men to a worse outcome. We're now following up these patients over a longer time period, to see how their hormone levels change over time, so we can try and answer these questions."

The annual EAU congress is Europe's biggest urology conference,

bringing together clinicians, scientists and patients to discuss the latest research and medical developments linked to the urinary tract and male reproductive system. EAU21 takes place virtually this year, due to COVID restrictions.

Professor Jens Sonksen, a member of the EAU Executive, said: "The SARS-CoV-2 pandemic has had a tremendous impact on global health since the virus first started spreading in early 2020. We have learned a lot about the virus and possible health consequences from COVID-19 since those early days, but there is much still to learn. This is highlighted by this new research, which found a surprisingly low level of total testosterone in men with COVID-19 compared to healthy controls. Symptomatic COVID-19 patients with low testosterone were also more likely to become critically ill from COVID-19. Additional research on potential impacts from COVID-19 on men's health is definitely needed."

More information: scientific-programme.uroweb.org/eau21

Provided by European Association of Urology

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