

Men experience a long-term drop in semen quality after COVID infection, research finds

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More than three months after suffering from mild COVID infection, men have lower sperm concentrations and fewer sperm that are able to swim, according to new findings presented at the 39th annual meeting of

the European Society of Human Reproduction and Embryology ([ESHRE](#)).

Professor Rocio Núñez-Calonge, scientific advisor at UR International Group at the Scientific Reproduction Unit, Madrid (Spain), said that after an average of 100 days following SARS-CoV-2 infection there appeared to be no improvement in [sperm quality](#) and concentration, even though new sperm would have been produced in that time.

"There have been previous studies that show [semen quality](#) is affected in the short term following a COVID infection but, as far as we are aware, none that have followed men for a longer period of time," she said. "We assumed that semen quality would improve once new sperm were being generated, but this was not the case. We do not know how long it might take for semen quality to be restored and it may be the case that COVID has caused [permanent damage](#), even in men who suffered only a mild infection."

Prof. Núñez-Calonge and colleagues had observed that, in some men attending clinics in Spain for assisted reproduction treatment, semen quality was worse after COVID infection than before the infection even though they had recovered and the infection was mild. So they decided to investigate if COVID had influenced the decline in quality.

"Since it takes approximately 78 days to create new sperm, it seemed appropriate to evaluate semen quality at least three months after recovery from COVID," said Prof. Núñez-Calonge.

Between February 2020 and October 2022, the researchers recruited 45 men attending six reproductive clinics in Spain to the study. All had a confirmed diagnosis of mild COVID, and the clinics had data from analysis of semen samples taken before the men were infected.

Another semen sample was taken between 17 and 516 days after infection. The median (average) age of the men was 31, and the amount of time that elapsed between the pre- and post-COVID samples was a median of 238 days. The researchers analyzed all the samples taken up to 100 days after infection, and then analyzed a subset of samples taken more than 100 days later.

They found a statistically significant difference in semen volume (down 20% from 2.5 to 2 milliliters), sperm concentration (down 26.5% from 68 to 50 million per ml of ejaculate), sperm count (down 37.5% from 160 to 100 million per milliliter of semen), total motility i.e. being able to move and swim forwards (down 9.1% from 49% to 45%) and numbers of live sperm (down 5% from 80% to 76%).

Prof. Núñez-Calonge said motility and the total sperm count were the most severely affected. Half of the men had total sperm counts that were 57% lower after COVID compared to their pre-COVID samples. The shape of the sperm was not significantly affected.

When the researchers looked at the group of men who provided a sample later than 100 days after COVID, they found that sperm concentration and motility had still not improved over time.

"The continuing effect of COVID infection on semen quality in this later period may be caused by permanent damage due to the virus, even in mild infection. We believe clinicians should be aware of the damaging effects of SARS-CoV-2 virus on male fertility. It is particularly interesting that this decrease in semen quality occurs in patients with mild COVID infection, which means that the virus can affect [male fertility](#) without the men showing any clinical symptoms of the disease," said Prof. Núñez-Calonge.

It is known that the SARS-CoV-2 virus can affect the testicles and

sperm, but the mechanism is still unknown. Prof. Núñez-Colange says that inflammation and damage to the [immune system](#) that is seen in patients with long COVID might be involved.

"The [inflammatory process](#) can destroy [germ cells](#) by infiltrating the [white blood cells](#) involved in the immune system, and reduce [testosterone levels](#) by affecting the interstitial cells that produce the male hormone," she said.

"It should be mentioned that impairment of semen parameters may not be due to a direct effect of the SARS-CoV-2 virus. There are likely to be additional factors that contribute to long-term sperm parameters decrease, but whose identity is currently unknown. Furthermore, we did not measure hormonal levels in this study: intense changes in testosterone, a key player involved in male reproductive health, has previously been reported in COVID-infected male patients."

The researchers plan to continue to study the men to measure both semen quality and hormonal status over time. They believe there should be more research into the reproductive functions of men after COVID infection to see if their fertility is affected temporarily or permanently.

The chair of ESHRE, Professor Carlos Calhaz-Jorge from the Northern Lisbon Hospital Center and the Hospital de Santa Maria in Lisbon (Portugal), was not involved in this research. He commented, "This is interesting research by Prof. Núñez-Colange and her colleagues and shows the importance of long-term follow-up of fertility patients after a COVID infection, even if it's a mild infection. However, it's important to note that the semen quality in these patients after a COVID infection is still within the World Health Organization's criteria for 'normal' semen and sperm. So, it is unclear whether these reductions in semen quality after a COVID infection translate into impaired fertility and this should be the subject of further research."

More information: Presentation no: O-020, "What is the recovery time for sperm parameters in men who have suffered a mild Covid-19 infection?" presented by Professor Rocio Núñez-Calonge, Session 04: Factors influencing sperm (dys)function, Hall D1, 11.15 hrs CEST, Monday 26 June 2023.

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