



## Prevention of sexual transmission of SARS-CoV-2: condom or abstinence?

### Prevención de la transmisión sexual de SARS-CoV2: ¿Condón o abstinencia?

Jesús David Pereira-Cabeza,<sup>1</sup> Laura Vanessa Valencia-Núñez,<sup>1</sup> Herney Andrés García-Perdomo.<sup>2</sup>

Dear Editor:

In December 2019, in the province of Hubei (Wuhan-China), there was an outbreak of a coronavirus-associated pneumonia, called coronavirus disease 2019 (COVID 19).<sup>(1)</sup> SARS-CoV-2 enters the cell by angiotensin-converting enzyme 2 (ECA 2) receptors that are expressed in multiple organs, including testicular tissue.<sup>(2)</sup> Protein S is most likely primed by transmembrane serine protease 2 (TMPRSS2), which interacts with ACE receptors, resulting in the successful entry of the virus into the cell.<sup>(3)</sup>

Respiratory and gastrointestinal symptoms of the disease were the first to be described<sup>(3)</sup> but some authors reported testicular discomfort in cases of acute infection.<sup>(2)</sup> Aerosols and contact are the main transmission routes of this virus;<sup>(4)</sup> however, SARS-CoV-2 has been found to be present in semen samples from COVID-19-positive patients and those in recovery.<sup>(5)</sup>

The testes possess a privileged immune system that protects immunogenic germ cells from the host's systemic response.<sup>(2)</sup> Even so, SARS-CoV-2, like other viruses, could cross the blood barrier of the testes and trigger an inflammatory response.<sup>(2,5)</sup> If viral replication does not occur, this pathogen could persist due to the specialized testicular immune defense system.<sup>(5)</sup> Damage to this immune environment can lead to orchitis, testicular injuries, and male fertility impairment<sup>(4)</sup> because of widespread destruction of germ cells and sperm, secondary to leukocyte infiltration.<sup>(1)</sup>

Coronavirus infection (SARS-CoV), which shares similarities with SARS-CoV-2, has been reported as a cause of orchitis<sup>(1)</sup> and both use the angiotensin-converting enzyme 2 (ACE2) as the receptor for invading cells.<sup>(4)</sup> Furthermore, spermatogonia, Leydig cells, and Sertoli

<sup>1</sup> Universidad de Cartagena, Colombia

<sup>2</sup> Universidad del Valle, Cali, Colombia

cells are known to be ACE2-positive cells.<sup>(4)</sup> The testes, and especially ACE2-positive cells, should be considered susceptible to SARS-CoV-2 infection and the binding of this virus to its receptor can alter tissues and thus be a source of viral transmission.

There is current knowledge of wide ranges of pathogens, including viruses, that cause sexually transmitted infections (STIs).<sup>(5)</sup> The presence of traditional non-sexually transmitted viruses, such as the Zika virus (ZIKV) and the Ebola virus (EBOV), has been confirmed in human genital secretions. Therefore, specific preventive measures, depending on the potential risk of sexual transmission, must be developed.<sup>(1)</sup> Accordingly, semen is a possible transmission route of SARS-CoV-2, especially in asymptomatic, mildly symptomatic, and recovered individuals, or during the incubation period.<sup>(1)</sup>

Future research on the existence and persistence of SARS-CoV-2 in semen is vital for public health. Based on the above, the presence of the virus in semen constitutes a possible form of transmission, making condom use or sexual abstinence feasible preventive measures against COVID-19 transmission in patients infected with the disease.

## References

1. **Cardona Maya WD, Du Plessis SS, Velilla PA.** SARS-CoV-2 and the testis: similarity with other viruses and routes of infection. *Reproductive BioMedicine Online.* 2020;40(6):763–4. doi: <https://dx.doi.org/10.1016%2Fj.rbmo.2020.04.009>
2. **Holtmann N, Edimiris P, Andree M, Doehmen C, Baston-Buest D, Adams O, et al.** Assessment of SARS-CoV-2 in human semen—a cohort study. *Fertil Steril.* 2020 Aug;114(2):233–8. doi: <https://dx.doi.org/10.1016%2Fj.fertnstert.2020.05.028>
3. **Pan F, Xiao X, Guo J, Song Y, Li H, Patel DP, et al.** No evidence of severe acute respiratory syndrome-coronavirus 2 in semen of males recovering from coronavirus disease 2019. *Fertil Steril.* 2020 Jun;113(6):1135–9. doi: <https://doi.org/10.1016/j.fertnstert.2020.04.024>
4. **Patel SK, Pathak M, Sah R, Kumar A, Malik YS, Rodríguez-Morales AJ, et al.** Is Sexual Route a Matter of Concern for the SARS-CoV-2/COVID-19? *Archives of Medical Research.* 2020; doi: <https://doi.org/10.1016/j.arcmed.2020.06.008>
5. **Li D, Jin M, Bao P, Zhao W, Zhang S.** Clinical Characteristics and Results of Semen Tests Among Men With Coronavirus Disease 2019. *JAMA network open.* 2020;3(5):e208292. doi: <https://doi.org/10.1001/jamanetworkopen.2020.8292>