

Expression of SARS-CoV2 Infectivity Machinery in the Male Reproductive Tract: Possible Outcomes on Fertility

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Abstract

Emergence of the COVID-19 pandemic continues to rage and rattles the entire world causing multifaceted hardships. Though initially thought to be a disease that primarily affects the lungs, latest evidence suggests its possible Long-term effects on multiple organ systems. SARS-Cov-2, the virus responsible for this disease infects the cells through ACE2 receptor and the serine protease TMPRSS2. In light of the fact that ACE2 expression is very high in the testis and the expression of TMPRSS2 in other reproductive organs, there has been growing interest to determine the effect of SARS-Cov-2 infection on the male reproductive system, especially on fertility. Through bioinformatics analyses, *in vitro* and cohort studies, the effects on SARS-Cov-2 infection at the molecular to physiological levels are proposed. Perturbations in hormonal levels, damage to the anatomical structure and inflammation in reproductive organs, decline in sperm count and sperm function have been reported. Thus, the significance of COVID-19 on global reproductive health has gained importance. In this article, we summarize the reported facts related to SARS-Cov-2 infectivity on male reproductive system. Such a comprehensive summation herein will help the researchers to have an up to date knowledge in this area of research and to coronavirus newer studies to address the effects of the COVID-19 pandemic on male reproduction, especially fertility.

Keywords: COVID-19, Fertility, Male Reproductive System, SARS-Cov-2

1. Introduction

The emergence of COVID-19 pandemic affected almost all the countries in a number of ways. As on 24th April, 2020, the pandemic caused 3,101,540 deaths and 146,312,705 infections worldwide to cause severe hardships in terms of health and economic crisis (<https://www.worldometers.info/coronavirus/>). COVID-19 is caused by the novel corona virus, SARS-Corona virus 2 (SARS-Cov-2), which primarily affects the respiratory system to cause severe lung disease¹. The infections primarily originated from the Wuhan city of Hubei province, China and culminated to infect millions of people across the world. In the last one and half years after the first outbreak of this disease in

December 2019, vast number of research studies reported the etiology and molecular mechanisms of this infection in the primarily affected organ i.e. the lung². Further, the susceptibility of other organs and the risks of post infection were also reported^{3,4}. Over a period of time it is emerging that this disease is not only fatal, but can cause High-risk mortality and morbidity in patients who have recovered from the infection. Considerable interest has also been generated to identify the effect of SARS-Cov-2 infections on the male reproductive tract. The gender bias for higher incidence of COVID-19 in men evinced interest to study the relation between the etiology of this disease and male reproductive physiology⁵. The purpose of this review is to consolidate the known aspects on the

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