The long-term oncopathology effects of COVID-19 infection and vaccination on the female reproductive system

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Abstract

Background: Since the COVID-19 pandemic started in 2019, it has resulted in various health conditions, including adverse effects on different systems. The female reproductive system (FRS) is known to be one of the organs affected by the virus or the vaccination due to its high expression of the ACE 2 receptor, which is one of the primary receptors of COVID-19 that facilitates its entry into the cells. This review assessed the impact of COVID-19 infection and vaccination on the female reproductive system and their relationship with endometrial, ovarian, cervical, and vulvar cancers. Recent findings: COVID-19 virus may elevate pro-inflammatory factors, such as TNF-α, IL-6, interleukin-1β (IL-1β), and interferon-gamma (IFN-γ), during both the acute and recovery phases of infection. COVID-19 infection can heighten the inflammatory response and cell susceptibility by downregulating the ACE-2 receptor. Additionally, COVID-19 influences the female reproductive system by altering the epithelial-mesenchymal tissue microenvironment and disrupting blood vessels and endothelial cells. However, studies fail to acknowledge the potential impact of vaccination on FRS. Conclusion: Given the pivotal roles of the TMPRSS2 enzyme and ACE2 receptor in the pathogenic mechanism of the coronavirus, it is suggested that cells expressing higher levels of these enzymes and receptors may be more prone to endometrial cancer development. Notably, the cytokine storm and ACE/ACE2 pathway imbalance increase the risk of ovarian cancer. Cervical cells have a low expression of the ACE2 receptor, reducing the likelihood of infection in intraepithelial cervical cells and cervical cancer. Although coronavirus infection and its immunization can lead to vulvar aphthous ulcers, limited research investigates the link between COVID-19 infection, immunization, and vulvar cancer.

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