



Are the COVID-19 mRNA Vaccines Safe During Pregnancy?

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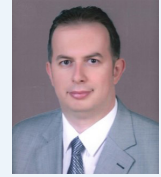
In pregnancy, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection represents an increased risk for severe coronavirus disease 2019 (COVID-19) when compared to nonpregnant reproductive age women. Especially in the third trimester, it may also be associated with some adverse pregnancy outcomes, like preterm birth (1, 2). Therefore, it seems to be beneficial for both mother and fetus to avoid from this disease during pregnancy.

Although various safe and effective vaccines have been developed and distributed across the world to bring the COVID-19 pandemic to an end, enough data to guide vaccine decision making in pregnancy are lacking. Therefore, the clinicians and pregnant women are uncertain about the safety of their administration during pregnancy (3).

The two COVID-19 messenger RNA (mRNA) vaccines developed by Pfizer-BioNTech and Moderna were included in World Health Organization (WHO) Emergency Use Listing (EUL) on 31 December 2020 and 30 April 2021, respectively (4). Nowadays, some pregnant women in the world have been receiving these vaccines with a limited data on their safety in pregnancy (5). When their completely different antigen delivery technologies, the development with state-of-the-art manufacturing processes and unprecedented rapidity were also taken into account, the concerns about their safety during pregnancy are further increased.

The COVID-19 mRNA vaccines work by carrying the genetic information necessary to manufacture the spike protein found on the surface of the SARS-CoV-2. After injection of vaccine into the muscle cells, the spike protein generated by the body's own cells is presented on the cell surface to T and B cells of the immune system. The immune response to this protein results in production of antibody, and cell-mediated immunity (3). The mRNA encapsulated in lipid nanoparticles does not enter the host cell nuclei and therefore, never integrate into DNA and does not cause genetic mutations. The mRNA is degraded in the cell cytoplasm within hours to days with an estimated

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half-life of 8 to 10 hours (6). Due to this short half-life, transmission to the fetus during pregnancy seems to be unlikely for the mRNA vaccines (7). Furthermore, neither a live virus nor an adjuvant to enhance vaccine efficacy is used in the mRNA vaccines (8).

Although the pregnancy was an strict exclusion criterion in randomized controlled trials for COVID-19 mRNA vaccines, limited data from pregnant women inadvertently enrolled in these trials is reassuring on the safety of vaccination in pregnancy (9, 10). In spite of short follow-up, preliminary findings of a study conducted with self-reported information of 35691 pregnant women after ongoing COVID-19 vaccination in the USA did not reveal any obvious safety issues with Covid-19 mRNA vaccines (5).

As a conclusion, based on the mechanism of action and the available data from limited clinical trials, the safety profile of Covid-19 mRNA vaccines for pregnant women and their fetuses might be expected to be favorable. Further data are needed to draw clear conclusions on this topic.

Ethical Issues

Not applicable.

Conflict of Interests

The author has no conflicts of interest to disclose.

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