**ABSTRACT**

Physiological change makes pregnant women more vulnerable to COVID-19 infection. It raises morbidity and mortality rates in pregnant women in comparison to the general population. Several morbidities have been reported such as earlier miscarriage, vaginal bleeding during pregnancy, edema in all extremities and also the face, hypertension during the gestational phase, foul-smelling vaginal discharge, and dysuria due to urinary tract infection, etc, with the effectiveness of reducing morbidity and mortality, vaccines play a key role, especially for this group. However, concerns arise about the safe pregnancy and the fetus. This paper addressed the most recent knowledge of the COVID-19 vaccine in pregnancy, as well as the vaccine’s pathophysiology, and the current study about safeness.

**Keywords:** Covid-19 vaccine, pregnancy, review, safeness of vaccine.

Meanwhile, inactivated vaccine (CoronaVac) is less effective than the mRNA vaccine. It was only 65.9 percent for COVID-19 prevention, 87.5 percent for inpatient hospital prevention, 90.3 percent for Intensive care unit admission prevention, and 86.3 percent for mortality prevention. Therefore, the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine on July 30, 2021, have been allowed several vaccines for pregnant women based on the previous studies that have been done.

ANTIGENIC TARGET

A large surface spike of protein was found in the major antigenic target of the SARS-CoV-2 and MERS vaccine. The spike protein has emerged as the primary antigenic target for COVID-19 vaccine development during pregnancy. In general, it stimulates membrane fusion by binding to the angiotensin-converting enzyme 2 (ACE2) receptor on host cells. Study results that antibodies bound to the receptor-binding domain of the SARS-CoV-2 spike protein can prevent virus attachment and neutralization ($P < 0.0001$).

VACCINE EFFECTIVITY

The titer antibody of the vaccine among the nonpregnant population was equivalent to pregnant and lactating groups by the median was 5.74 ($P=0.24$).

In the pregnancy and lactating phase after getting the second dose of the vaccine, established the median titer antibody of RBD-IgG was higher rather than before the vaccination. Furthermore, binding, neutralizing, and functional non-neutralizing antibody responses, as well as CD4 and CD8 T-cell responses, were performed under that condition.

During a 77-day media follow-up, in the vaccination group, there were 131 infections, while the control group had 235 infections, were documented. After the first dose of the vaccine (around 14-20 days). The vaccine effectiveness was approximately 67% (95%CI = 40-84). The enhancement of titer after the first vaccination was performed. After re-evaluation on days 21-27 the titer was
71% (95%CI=33–94). The secondary dose also was done. It performed 96% (95%CI=89–100) in days 7-56. For the symptomatic patient, the estimation of the first dose vaccine (days 14-17) was 66% (95% CI =32–86%). It increases after administering the second dose. The enhancement became 76% (95% CI=30–100) on days 21–27 and 97% (CI95%=91–100) on days 7–56. After 7–56 days of vaccination, vaccine effectiveness for COVID-19-related hospitalization was 89 percent (95 percent CI =43–100). Due to the small number of events, vaccine effectiveness for the other outcomes and periods could not be estimated meaningfully.7

A study related to the neonates that were born from the mother who was infected by the COVID-19 during pregnancy has been reported by Megan et al. In this study showed from 36 samples, all of the neonates were positive for anti-S IgG at high titers: 34 with a titer of > 250 U/mL and two with titers of 201 U/mL and 249 U/mL, respectively.13

**VACCINE SAFETIES**

There was no adequate evidence of adverse events for the fetus after the mother administered the COVID-19 vaccine. It also did not impact fetal development.14 The study invivo did not find a harmful effect on the sample in pregnancy. Vaccine effectiveness for COVID-19-related hospitalization was 89 percent after 7–56 days of vaccination (CI95% %=43–100). Due to the small number of events, vaccine effectiveness for the other outcomes and periods could not be estimated meaningfully. Another supporting study has been declared by England public health that the state did not find any serious adverse events after administering the first dose vaccine of COVID-19 to 62,000 pregnant women. The same results were also reported by Scotland public health with 4000 pregnant women samples. Meanwhile, no long-term effects on babies born to women who received a COVID-19 vaccine during pregnancy have been studied, but because COVID-19 vaccines are made by not alive vaccines, it could not cause any infection, and other similar vaccines besides COVID-19 vaccine have been given during pregnancy phase for many years with no safety concerns. Another report stated that 133 women who received at least one dose of the COVID-19 vaccine during pregnancy had similar rates of adverse pregnancy outcomes (P>0.05 for all), including stillbirth (0.0 percent vs 0.3 percent), fetal anomalies (2.2 percent vs 2.7 percent), intrapartum pyrexia (3.7 percent vs 1.5 percent), and postpartum hemorrhage (9.8 percent (5.3 percent vs 5.4 percent) if it compared with the nonpregnant woman.15

Furthermore, no differences were discovered when pregnant women who participated in the v-safe pregnancy registry were compared to the baseline rates of adverse pregnancy outcomes (Figure 3). These systems will continue to collect evidence on this topic and will provide data for recommendations in the future.9

**CONCLUSION**

The vaccine has great benefits for the pregnant women population. Not only give protection for pregnant women but also the neonates who were just born from a vaccinated mother have antibodies to COVID-19. Studies also show there are no adverse effects to pregnancy and the fetus compared to the nonvaccine population. However, the long-term effect of this vaccine has not been known yet.

**AUTHOR CONTRIBUTION**

All authors have contributed substantially during the conception of the manuscript, gathering and analyzing related literature, drafting and revising the manuscript, giving final approval, and have agreed to be accountable.

**CONFLICT OF INTEREST**

None.

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**REFERENCE**


