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REVIEW ARTICLE

COVID Vaccination during Pregnancy and Lactation: A Mini review

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Abstract
COVID-19 Vaccination during pregnancy and lactation is still under investigation. In this mini review we have attempted to collect evidence from the online resources mainly the MIDRIS (Midwives Information and Resource Service). As health care workers we need the evidence to advice pregnant and lactating women on the possible effects of the COVID-19 mRNA vaccine.
Key words: COVID-19 Vaccination for parturient women, vaccination during pregnancy and lactation, COVID vaccination uptake, Effects of COVID-19 mRNA vaccine

Introduction

Midwives and pregnant women need a lot of support during this unprecedented time relating to safe delivery and care expectations. Receiving vaccination during the pregnancy and postnatal period is still under research has no conclusive evidence available. The introduction of BNTT 162b2 Pfizer and Moderna mRNA vaccines led to many questions like is it safe to administer to pregnant and lactating women, effects of this COVID vaccine on fertility, and the choice of vaccines. In this short article we have tried to discuss the best possible evidence available from the Midwifery digest literature search which is a part of the Royal College of Midwives London. This literature pack compiled evidence from research reported from clinical trials, primary research, and the systematic reviews. In December 2020 the US the FDA (Food and Drug administration) gave emergency authorization for the two new messenger RNA (mRNA) vaccines for patients who suffered severe acute respiratory syndromes coronavirus 2 (Bertrand k et al 2021). The below table is a summary of studies reported on vaccination during pregnancy and lactation, effects on growing foetus, decision making on receiving vaccination and vaccination post-natal period.

Table: Summary of Studies Reviewed on COVID-19 Vaccination During Pregnancy And Lactation.

Name of the author and year	Objective of the study	Sample/participants, Research design& Location	Name of vaccine received	Outcome of the study
Bertrand K eta l (2021)	To study the maternal and infant symptoms after the 2 doses of mRNA vaccine	Breast feeding women who received 2 doses of mRNA vaccines were included in the cross-sectional study in the	Received 2 doses of mRNA (Pfizer 89.4% and Moderna	No serious concerns reported in mother and baby. However, women who had 2nd dose of Moderna reported systemic

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		United States N=180 (128 received Pfizer and 52 received Moderna.	98.1%)	side effects like chills, fever, body aches and local reactions. Three women reported change in colour of milk after vaccination from blue to green and back to normal in few days.
Nir O et al (2021)	To determine the maternal-neonatal transfer of SARS CoV-2 (via placenta) antibodies among parturient women who were vaccinated	64 women who had vaccines and 11 women who contracted the COVID infection via a prospective cohort study in Israel	Vaccinated with BNT162B2 mRNA	98.3% of cord blood serum samples were positive for the antibodies with SARS CoV IgG. And 96.4 % of neonatal blood spot samples had the antibodies and all women had it in their breast milk.
Charepe N et al (2021)	To study the possible transfer of antibodies via breast milk after receiving the BNT162B2 Pfizer vaccine	Prospective cohort study consisting of 24 health care workers out of which 14 were breast feeding and 10 were non-breast-feeding women who had Pfizer vaccine at Helsinki	Vaccinated with BNT162B2 mRNA Pfizer vaccine	The presence of antibodies in breast milk after vaccination was scarce and recommends further research
Hirshberg J.S et al (2021)	To describe the vaccine uptake experience from the Health workers	Quality improvement project done at Missouri, Illinois with 93 women who received vaccine	Vaccinated with BNT162B2 mRNA vaccine	3% of eligible high-risk patients had their vaccines, others did not have the vaccine due to hesitancy and non-availability of vaccine. Counselling women and further research is recommended by the authors
Kachikis A et al (2021)	To study the experience of pregnant and breast-feeding women after receiving the vaccination for	Online prospective cohort study done in the USA who were pregnant, lactating or planning for pregnancy N=17,525	Most participants received the BNT162B2 mRNA Pfizer vaccine	97% reported local reactions such as pain, body aches and tiredness. However, they had experienced more severe symptoms

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	COVID-19			after their second dose of vaccine. 0.7% reported miscarriage after the second dose.
Esteve-Palau E et al (2021)	To quantify the level of SARS CoV-2 antibodies in the breast milk of women who were vaccinated	Prospective cohort study among lactating women who received vaccines N=33 in Barcelona	BNT162B2 mRNA Pfizer vaccine	Results reported presence of SARS CoV-19 antibodies in breast milk and at a higher level after second dose of the vaccine
Kharbanda EO et al (2021)	To study the safety of vaccine effects among the pregnant women	Case control Surveillance study among pregnant who received vaccines N= 105,446 in US (8 states)	BNT162B2 mRNA Pfizer, Moderna and Janssen vaccine	13 160 spontaneous abortions were reported either after 1st or 2nd dose of the vaccine, however the gestational age during abortion and further pregnancies were not reported. Women who were in the age range of 35-49 years, 38% reported abortions.
Theiler R.N et al (2021)	To assess the efficacy of the SARA-CoV-2 Vaccination in pregnancy	Comprehensive vaccine registration study with 2002 cases 140 received vaccine and 212 had contracted the COVID-19 infection during pregnancy	BNT162B2 mRNA vaccine	No COVID-19 infection was reported among women after vaccination. Thromboembolic events and preterm labours were reported in few cases.
Blakeway H et al (2021)	To investigate the uptake of vaccination and its determinants and perinatal outcomes	Cohort study carried out in the UK. Among 1328 women 141 received atleast one dose of the vaccine	mRNA vaccine	Out of the 85% who received the vaccine they had it in the last trimester of pregnancy and 14.2% received the vaccine in the second trimester.
Collier AY et al (2021)	To assess the immunogenicity of the mRNA vaccine during pregnancy and lactation	Exploratory, descriptive, prospective cohort study103 women from Israel	mRNA vaccine	Women who received COVID-19 mRNA vaccine were found to be immunogenic both during pregnancy and lactation.

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Discussion

Vaccinating for COVID-19 infection among pregnant and lactating women is considered vital because it involves 2 lives, possibility of infection being transferred to the baby and are at a higher risk of admission to intensive care unit and develop complications when compared to other women (Colloer Ay et 2021).The decision to have the vaccine is left to the women to decide, however the possible side-effects and the benefits have been experimented by many researchers around the world within a short period. The above studies tabulated were all done last year and reported their findings. Majority of the studies were reported from the United States and European countries, less studies have been published from Asian countries. It is evident that COVID-19 vaccines were well tolerated among the pregnant and lactating women and 0.7% reported miscarriage after their second doses of the vaccine Kachikis A et al (2021). However, the study done by Kharbanda EO et al (2021) reported higher abortion rates (38%) among women aged 35-49 after receiving the vaccinations indicates women with an increasing in age during pregnancy who had the vaccine were experiencing high rates of spontaneous abortion. This might need further enquiry. The vaccine uptake study showed atleast one third of women received vaccines and women from non-white and Asian race, from low economic status and young women were hesitant to take the vaccines (Blakeway H eta l (2021). This indicates that awareness on vaccination among the women who are hesitant will improve the vaccination uptake. International and national guidelines to vaccinate pregnant and lactating women are readily available and the part of communicating that to the target group is to be considered critical. Measures to keep the women informed regarding the benefits of vaccination should be facilitated by midwives.

Conclusion

This mini review had few limitations as we did not have data from all databases and before 2021 as the pandemic is Novel and further investigation needed. More research on outcome of vaccination using large samples and from different continents is awaited. In general, it is evident that COVID-19 mRNA vaccine had been well tolerated among the pregnant and lactating women. It has been reported as safe to administer vaccine during pregnancy and lactation in majority of the studies under this review.

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