

MATERNAL AND FETAL OUTCOME OF PREGNANT PATIENTS GIVEN COVID-19 VACCINATION DURING ANTENATAL PERIOD

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Abstract: This study aimed to assess potential adverse maternal and fetal outcomes among pregnant women who received COVID-19 vaccination during pregnancy. The study was conducted at the Lady Reading Hospital, Peshawar, gynaecology OPD. It included 120 pregnant females aged 18-35 years with a gestational age of more than 32 weeks. Of the 120 participants, 60 received the COVID-19 vaccine during pregnancy, while 60 did not. The study aimed to determine whether there were any adverse outcomes, such as eclampsia/preeclampsia, fetal growth restriction, NICU admission, preterm birth, birth weight, and postpartum haemorrhage. The study found that 60% of the participants were vaccinated for COVID-19 during pregnancy, while 60% did not receive the vaccine. Both cohorts showed no significant difference in terms of adverse outcomes such as eclampsia/preeclampsia, fetal growth restriction, NICU admission, preterm birth, birth weight, and postpartum haemorrhage. No significant difference was found in fetomaternal outcomes between the two groups. Pregnant females who received the COVID-19 vaccine during pregnancy did not experience any significant adverse outcomes such as eclampsia/preeclampsia, fetal growth restriction, NICU admission, preterm birth, birth weight, and postpartum haemorrhage.

Keywords: COVID-19, Vaccination, Pregnancy, Adverse Outcomes

Introduction

In 2019, a worldwide crisis emerged that would profoundly alter communities, economics, and healthcare systems across the globe. The virus's mode of transmission, which involves respiratory droplets and, in certain instances, aerosolised particles, enabled its swift dissemination across national boundaries (Bahl et al., 2022; Baloch et al., 2020). The convergence of maternal health, baby well-being and the COVID-19 pandemic has substantially emphasised the effects of vaccination during pregnancy (Shah et al., 2020). Amidst the intricacies of the SARS-CoV-2 virus, women who are pregnant encounter distinct obstacles and factors to consider in safeguarding their well-being and that of their unborn offspring (Pukale and Pragathi, 2021). The choice to vaccinate pregnant females is being closely examined, requiring a detailed analysis of the effects on both the mother and the fetus when vaccinated during pregnancy (Blakeway et al., 2022; Riley, 2021).

Pregnancy, a natural condition that intrinsically modifies the immune response, has traditionally posed difficulties in producing and delivering vaccines (Rasmussen et al., 2021). The advent of the new coronavirus heightened apprehensions regarding the potential hazards linked to maternal infection in pregnancy. Although early research indicated that pregnant persons may have a higher susceptibility to severe disease caused by COVID-19, concerns were raised concerning the safety and effectiveness of vaccines designed to fight against the virus (Goncu Ayhan et al., 2021).

As clinical studies and real-world data became available, valuable information regarding the safety and effectiveness of vaccines (Bleicher et al., 2021). Initial results indicated that the COVID-19 vaccine protected pregnant females and

potentially granted passive immunity to the infant. This was achieved by transferring maternal antibodies through the placenta and breastfeeding. This finding emphasised the potential advantages of vaccination: protecting the health of mothers and creating a barrier of protection for fragile newborns in the first few months of life (Ellington and Olson, 2022; Ma et al., 2022; Skjefte et al., 2021).

As we explore the complex field of fetomaternal outcomes related to COVID-19 vaccination in pregnancy, it becomes clear that this subject goes beyond the confines of the laboratory and clinic. This investigation aims to offer a thorough analysis of the existing knowledge on COVID-19 vaccination in pregnancy. This study explores the existing evidence, the current state of research, and the broader impact on public health. By engaging in this action, we actively participate in the current discussion regarding the connection between the health of pregnant women and their unborn children and the crucial impact vaccination has on determining the results, especially in these exceptional circumstances.

Methodology

After getting ethical approval from the hospital, this cohort study was carried out from July 2021 to July 2022 at Lady Reading Hospital, Peshawar, gynaecology OPD. One hundred twenty pregnant females, aged 18 to 35 years, with gestational age less than thirty-two weeks with a singleton pregnancy, were included in this study. We divided the patients into two cohorts equally; sixty patients were vaccinated for COVID-19 (SinoVac) during pregnancy, while sixty were not vaccinated. The patient's vaccination status was verified by their COVID-19 vaccine certificate

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issued by the National Database and Registration Authority of Pakistan. Demographic data of all patients was taken and entered into a predesigned pro forma. We determined the adverse outcomes in terms of eclampsia/preeclampsia, fetal growth restriction, NICU admission, preterm birth, birth weight and postpartum haemorrhage in pregnant females who received the vaccination during pregnancy.

Data was analysed using SPSS 20. T-tests and Chi-Square tests were applied to assess the outcomes between cohorts.

Results

One hundred twenty pregnant females were selected for the study. Sixty females were vaccinated during pregnancy for COVID-19, while sixty patients did not receive the vaccination. The mean age of the vaccinated females was 27.18±4.96 years, while 27.22±5.07 years for non-vaccinated females. The mean gestational age of the

vaccinated females was 38.03±1.61 weeks, while 37.72±1.82 weeks of non-vaccinated females. Three (5%) vaccinated females had eclampsia /Preeclampsia, while 5 (8.3%) non-vaccinated females had eclampsia /Preeclampsia. Fetal growth restriction was observed in 2 (3.3%) vaccinated and 3 (5%) non-vaccinated females. NICU admission was 5 (8.3%) in the vaccinated and 6 (10%) in the non-vaccinated cohort. In the vaccinated group, preterm birth was 5 (8.3%), while 8 (13.3%) were in the non-vaccinated group. 9 (15%) vaccinated females had a postpartum haemorrhage, while 8 (13%) non-vaccinated females had a postpartum haemorrhage. Birth weight in the vaccinated group was 3.3238±.46046 kg while 3.3358±.44021 kg in the non-vaccinated group. There was no notable difference in adverse fetal outcomes between the two groups.

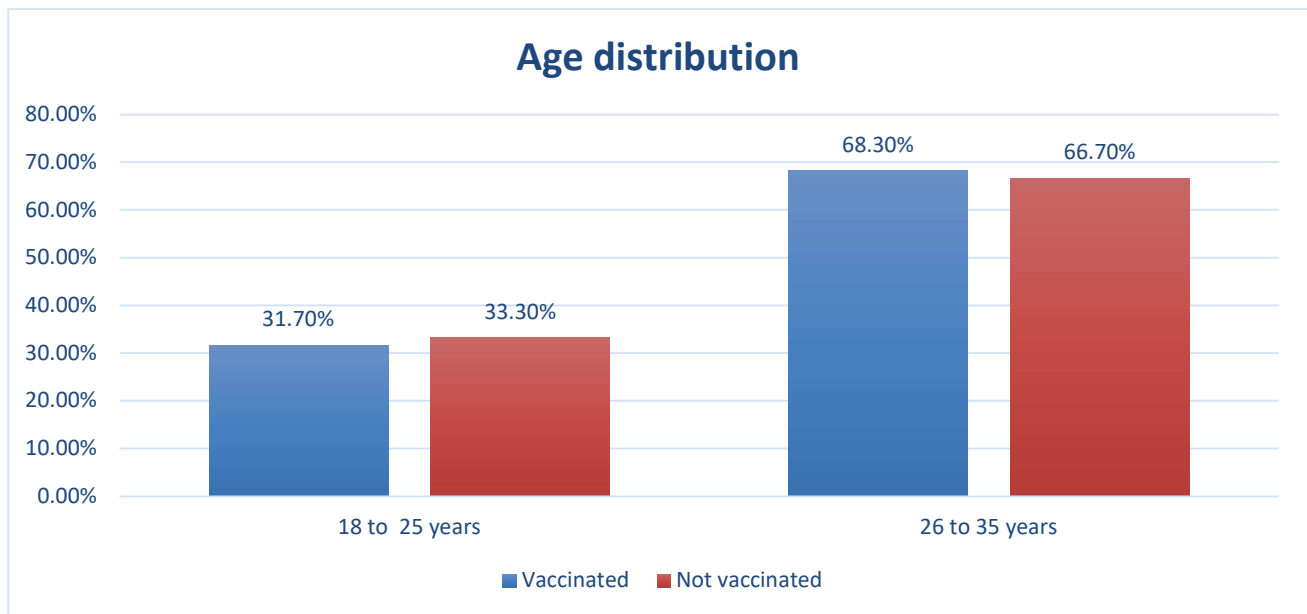


Figure 1 Distribution of age between the groups

Table 1 Demographics characteristics of study population

Demographics	Vaccination status	N	Mean	Std. Deviation
Age (Years)	Vaccinated	60	27.18	4.963
	Not vaccinated	60	27.22	5.076
Gestational age (weeks)	Vaccinated	60	38.03	1.615
	Not vaccinated	60	37.72	1.823

Table 2 Feto maternal outcomes

Feto maternal outcomes	Vaccination status				P value
	Vaccinated		Not vaccinated		
	N	%	N	%	
Eclampsia /Preeclampsia	3	5.0%	5	8.3%	0.46
Fetal growth restriction	2	3.3%	3	5.0%	0.64
NICU admission	5	8.3%	6	10.0%	0.75
Preterm birth (< 37 weeks)	5	8.3%	8	13.3%	0.37
Postpartum Hemorrhage	9	15.0%	7	11.7%	0.59
Birth weight (kg)	3.3238±.46046		3.3358±.44021		0.88

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Discussion

Alongside individual protective actions such as hand hygiene, mask usage, and maintaining social distance, vaccination has emerged as the most potent tool in combating the transmission of COVID-19, similar to its role in earlier pandemics (Süt et al., 2023). Pregnant women who develop symptoms of COVID-19 have a higher chance of experiencing health complications and death. Hence, immunisation should not be eschewed on account of pregnancy (Joubert et al., 2022).

Pregnant adults face an elevated chance of experiencing adverse COVID-19 outcomes in comparison to non-pregnant individuals. Following infection with SARS-CoV-2, there is a notable increase in the occurrence of adverse pregnancy outcomes, including premature birth and stillbirth. Administering vaccines during pregnancy is a standard recommendation to avoid illness and death in pregnant individuals and babies caused by many infectious diseases, such as influenza and pertussis (Goldshtein et al., 2021). Following the availability of COVID-19 vaccines, numerous countries have implemented guidelines advocating for COVID-19 vaccination in pregnancy to mitigate the risk of severe COVID-19 and associated consequences among pregnant individuals. Due to the absence of prelicensure data about this particular group, it is crucial to continuously evaluate safety to eliminate any potential risks of negative consequences for the mother, foetus, and newborn. The findings from extensive epidemiological studies have not shown any notable rise in the likelihood of adverse fetomaternal outcomes following COVID-19 vaccination in pregnancy. Nevertheless, there is insufficient data from large populations regarding other potential consequences of COVID-19 vaccination during pregnancy (Gray et al., 2021).

A comprehensive study showed that pregnant females who were administered the COVID-19 vaccine in pregnancy found no significant correlation between vaccination and an elevated risk of PPH, NICU admission, or lower Apgar score. The results remained consistent when analysed based on the number of doses administered during pregnancy, the specific vaccination used, or the trimester in which the first dose was given. Furthermore, the interpretations remained consistent even when comparing the group of individuals who were not vaccinated during pregnancy (Fell et al., 2022).

The current study compared pregnant women who received the vaccine during pregnancy with those who did not about adverse pregnancy outcomes. The groups did not differ significantly, except for the. We compared both cohorts for eclampsia/preeclampsia, fetal growth restriction, NICU admission, preterm birth, birth weight and postpartum haemorrhage. No notable difference was seen.

Our findings are aligned with various studies, which also reported a notable difference in the fetomaternal outcomes of pregnant women vaccinated during pregnancy compared to women who did not receive vaccination (Fell et al., 2022; Goldshtein et al., 2021; Gray et al., 2021; Joubert et al., 2022; Regan and Munoz, 2021).

Conclusion

The study concluded a significant prevalence of upper cross syndrome in female physiotherapists. Variables

like working hours posed serious risks for initiating UCS among professionals. Upper Cross Syndrome (UCS) prevalence was 27% in working physiotherapists; however, females and people who work long hours were more likely to develop Upper Cross Syndrome (UCS). It was also discovered that there is a strong correlation between Upper Cross Syndrome and Work-Related Musculoskeletal Disorders (WRMDs).

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned.

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared absence of conflict of interest.

Author Contribution

SAMINA ALIYA SABIR (Assistant Professor)

Coordination of collaborative efforts.

Conception of Study, Development of Research Methodology Design, Study Design,, Review of manuscript, final approval of manuscript

Data acquisition, analysis.

SHAHIDA SULTAN (Assistant Professor)

Manuscript revisions, critical input.

Coordination of collaborative efforts.

Data entry and Data analysis, drafting article

References

- Bahl, P., Doolan, C., De Silva, C., Chughtai, A. A., Bourouiba, L., and MacIntyre, C. R. (2022). Airborne or droplet precautions for health workers treating coronavirus disease 2019? *The Journal of infectious diseases* **225**, 1561-1568.
- Baloch, S., Baloch, M. A., Zheng, T., and Pei, X. (2020). The coronavirus disease 2019 (COVID-19) pandemic. *The Tohoku journal of experimental medicine* **250**, 271-278.
- Blakeway, H., Prasad, S., Kalafat, E., Heath, P. T., Ladhani, S. N., Le Doare, K., Magee, L. A., O'Brien, P., Rezvani, A., and von Dadelszen, P. (2022). COVID-19 vaccination during pregnancy: coverage and safety. *American journal of obstetrics and gynecology* **226**, 236. e1-236. e14.
- Bleicher, I., Kadour-Peero, E., Sagi-Dain, L., and Sagi, S. (2021). Early exploration of COVID-19 vaccination safety and effectiveness during pregnancy: interim descriptive data from a prospective observational study. *Vaccine* **39**, 6535-6538.
- Ellington, S., and Olson, C. K. (2022). Safety of mRNA COVID-19 vaccines during pregnancy. *The Lancet Infectious Diseases* **22**, 1514-1515.
- Fell, D. B., Dhinsa, T., Alton, G. D., Török, E., Dimanlig-Cruz, S., Regan, A. K., Sprague, A. E., Buchan, S. A., Kwong, J. C., and Wilson, S. E. (2022). Association of COVID-19

- vaccination in pregnancy with adverse peripartum outcomes. *Jama* **327**, 1478-1487.
- Goldshtein, I., Nevo, D., Steinberg, D. M., Rotem, R. S., Gorfine, M., Chodick, G., and Segal, Y. (2021). Association between BNT162b2 vaccination and incidence of SARS-CoV-2 infection in pregnant women. *Jama* **326**, 728-735.
- Goncu Ayhan, S., Oluklu, D., Atalay, A., Menekse Beser, D., Tanacan, A., Moraloglu Tekin, O., and Sahin, D. (2021). COVID-19 vaccine acceptance in pregnant women. *International Journal of Gynecology & Obstetrics* **154**, 291-296.
- Gray, K. J., Bordt, E. A., Atyeo, C., Deriso, E., Akinwunmi, B., Young, N., Baez, A. M., Shook, L. L., Cvrk, D., and James, K. (2021). Coronavirus disease 2019 vaccine response in pregnant and lactating women: a cohort study. *American journal of obstetrics and gynecology* **225**, 303. e1-303. e17.
- Joubert, E., Kekch, A., and Amin, C. (2022). COVID-19 and novel mRNA vaccines in pregnancy: an updated literature review. *BJOG: An International Journal of Obstetrics & Gynaecology* **129**, 21-28.
- Ma, Y., Deng, J., Liu, Q., Du, M., Liu, M., and Liu, J. (2022). Effectiveness and safety of COVID-19 vaccine among pregnant women in real-world studies: a systematic review and meta-analysis. *Vaccines* **10**, 246.
- Pukale, R. S., and Pragathi, D. (2021). Fetomaternal Outcome in Covid Positive Pregnant Women. *Journal of Medical Sciences* **7**, 67.
- Rasmussen, S. A., Kelley, C. F., Horton, J. P., and Jamieson, D. J. (2021). Coronavirus disease 2019 (COVID-19) vaccines and pregnancy: what obstetricians need to know. *Obstetrics and gynecology* **137**, 408.
- Regan, A. K., and Munoz, F. M. (2021). Efficacy and safety of influenza vaccination during pregnancy: realizing the potential of maternal influenza immunization. *Expert Review of Vaccines* **20**, 649-660.
- Riley, L. E. (2021). mRNA Covid-19 vaccines in pregnant women. Vol. 384, pp. 2342-2343. Mass Medical Soc.
- Shah, P. T., Shah, S. R., Shah, S. R., Yadav, P. A., Patel, B. S., and Chudasama, T. J. (2020). Fetomaternal outcome in COVID-19 infected pregnant women: a preliminary clinical study. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology* **9**, 3704-3711.
- Skjefte, M., Ngirbabul, M., Akeju, O., Escudero, D., Hernandez-Diaz, S., Wyszynski, D. F., and Wu, J. W. (2021). COVID-19 vaccine acceptance among pregnant women and mothers of young children: results of a survey in 16 countries. *European journal of epidemiology* **36**, 197-211.
- Süt, H., Yıldız, G. A., Şeker, E., Ümit, C., Koçar, M., and Koç, A. (2023). Maternal and perinatal outcomes of COVID-19 vaccination during pregnancy. *Journal of the Turkish German Gynecological Association* **24**, 120.



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