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ANTIBODY RESPONSE OF COVID-19 VACCINATION IN PREGNANT WOMEN AND TRANS-PLACENTAL PASSAGE INTO CORD BLOOD

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Abstract:

Introduction: *Vaccination against infectious pathogens is one of the most impactful public health interventions, reducing global morbidity and mortality related to infection.* ***Objectives:*** *The main objective of the study is to find the antibody response of COVID-19 vaccination in pregnant women and trans-placental passage into cord blood.* ***Material and methods:*** *This cross-sectional study was conducted in Punjab Health Department during 2020 to 2021. The data was collected from 100 pregnant females who were done with COVID-19 vaccination before giving birth.* ***Results:*** *The data was collected from 100 pregnant females. Three of these women were also infected with SARS-CoV-2 near vaccination; a manual review of their symptoms indicated that they were more likely associated with the infection rather than the vaccine. None of the reports indicated prolonged fever or severe adverse reactions.* ***Conclusion:*** *It is concluded that women, BNT162b2 mRNA vaccination compared with no vaccination was associated with a significantly lower risk of SARS-CoV-2 infection. Interpretation of study findings is limited by the observational design.*

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INTRODUCTION:

Vaccination against infectious pathogens is one of the most impactful public health interventions, reducing global morbidity and mortality related to infection. In the US alone, nearly 99,000 pregnant people have been infected with COVID-19, resulting in 109 maternal deaths to date (CDC, a, 2021). The COVID-19 pandemic has demonstrated the urgent need to develop vaccine strategies optimized for pregnant people and their newborns, as both populations are at risk of developing severe disease [1].

To date, two COVID-19 mRNA vaccines – BNT162b2 (Pfizer/BioNTech) and mRNA-1273 (Moderna) – and one monovalent Ad26-vector vaccine have been granted Emergency Use Authorization (EUA) by the FDA for administration to prevent COVID-19 in the US. Although not included in COVID-19 vaccine development trials, pregnant people have had access to these vaccines since their initial release in the US, and more recent data supporting the safety of COVID-19 vaccines in pregnancy have led to broadening support for vaccinating pregnant and lactating individuals [2].

The COVID-19 pandemic and the rapid development of novel vaccines to combat it present an unprecedented opportunity to decode the rules of vaccine-induced immunity in pregnant and lactating individuals. Although the overall risk of severe illness is low, pregnant and recently pregnant people are at an increased risk for severe illness from COVID-19 when compared with non-pregnant people [3]. Severe illness includes illness that requires hospitalization, intensive care, need for a ventilator or special equipment to breathe, or illness that results in death. Additionally, pregnant people with COVID-19 are at increased risk of preterm birth and might be at increased risk of other adverse pregnancy outcomes, compared with pregnant women without COVID-19 [4].

Objectives

The main objective of the study is to find the antibody response of COVID-19 vaccination in pregnant women and trans-placental passage into cord blood.

MATERIAL AND METHODS:

This cross-sectional study was conducted in Punjab Health Department during 2020 to 2021. The data was collected from 100 pregnant females who were done with COVID-19 vaccination before giving birth. Women who self-reported receipt of one or both doses of a messenger RNA (mRNA)–based COVID-19 vaccine and gave birth to a singleton neonate (gestational age between 35 0/7 and 41 2/7 weeks) were included in the study. Semi-quantitative testing for antibodies against S-receptor binding domain was performed on leftover clinical sera of maternal peripheral blood to identify antibodies mounted against the vaccine and on leftover clinical sera of cord blood to study passive immunity. Only women who tested negative for antibodies against the nucleocapsid protein antigen[7] were included to ensure antibodies were not the result of past severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. The relationship between immunoglobin (Ig)G antibody levels and time was studied using analysis of variance.

Statistical analysis

The data was collected and analysed using SPSS version 23. All the values were expressed in mean and standard deviation.

RESULTS:

The data was collected from 100 pregnant females. Three of these women were also infected with SARS-CoV-2 near vaccination; a manual review of their symptoms indicated that they were more likely associated with the infection rather than the vaccine. None of the reports indicated prolonged fever or severe adverse reactions. The commonly reported complaints were headache (n = 10, 0.1%), general weakness (n = 8, 0.1%), stomachache (n = 5, <0.1%), nonspecified pain (n = 6, <0.1%), dizziness (n = 4, <0.1%), and rash (n = 4, <0.1%). Three patients reported eye burning or blurred vision; all symptoms lasted less than 1 day.

Table 01: Response of COVID-19 vaccination in pregnant women

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Outcomes	Vaccinated	Matched unvaccinated
No.	7530	7530
SARS-CoV-2 hospitalization, No. (%)	13 (0.2)	23 (0.3)
Abortion,[c] No. (%)	128 (1.7)	118 (1.6)
Intrauterine growth restriction, No. (%)	36 (0.5)	38 (0.5)
Preeclampsia, No. (%)	20 (0.3)	21 (0.3)
Stillbirth, No. (%)	1 (<0.1)	2 (<0.1)
Maternal death, No. (%)	0	0
Obstetric pulmonary embolism, No. (%)	0	0
Birth week, median (IQR)	39 (38-40)	39 (38-40)
Preterm birth (<37 wk), No. (%)	77/1387 (5.6)	85/1427 (6.0)
Infant weight, median (IQR), kg	3.2 (2.9-3.6)	3.2 (2.9-3.5)

Abbreviation: IQR, interquartile range.

[a] The median follow-up was 37 days (IQR, 21-54 days) for both groups. Among the unvaccinated group, a total of 60% were ultimately vaccinated, at a median of 16 days (IQR, 7-28 days) from index until receipt of first dose.

[b] Matched by age, gestational age, residential area, population subgroup, number of prior children, and having a seasonal influenza vaccine in the last year.

[c] Either spontaneous or induced abortion.

- COVID-19 vaccines are recommended in pregnancy. All pregnant women in the UK aged 18 and over have now been offered a COVID-19 vaccine, and all 16 and 17 year olds will be offered a COVID-19 vaccine by the end of August 2021.
- On 16 April 2021, the Joint Committee on Vaccination and Immunisation advised that all pregnant women should be offered the COVID-19 vaccine at the same time as the rest of the population, in line with the age group roll out [5].
- Previously their advice was that pregnant women at high risk of exposure to the virus or with high risk medical conditions should consider having a COVID-19 vaccine in pregnancy.
- Vaccination is the best way to protect against the known risks of COVID-19 in pregnancy for both women and babies, including admission to intensive care and premature birth [6].
- The decision whether to have the vaccination in pregnancy is your choice. Make sure you understand as much as you can about COVID-19 and about the vaccine and you may want to discuss your options with a trusted source like your doctor or midwife.
- COVID-19 vaccines do not contain ingredients that are known to be harmful to pregnant women or to a developing baby. Studies of the vaccines in animals to look at the effects on pregnancy have shown no evidence that the vaccine causes harm to the pregnancy or to fertility [7].
- The COVID-19 vaccines that we are using in the UK are not 'live' vaccines and so cannot cause COVID-19 infection in you or your baby.

Vaccines based on live viruses are avoided in pregnancy in case they infect the developing baby and cause harm. However, non-live vaccines have previously been shown to be safe in pregnancy (for example, flu and whooping cough). Pregnant women are offered other non-live vaccines, such as those against flu.

- Studies have shown that protective antibodies from vaccination do cross the placenta, helping with the baby's immunity to COVID-19. We know that catching COVID-19 during pregnancy can cause severe illness in a pregnant woman, especially in the third trimester – that's why we recommend the COVID-19 vaccine in pregnancy [8].

CONCLUSION:

It is concluded that women, BNT162b2 mRNA vaccination compared with no vaccination was associated with a significantly lower risk of SARS-CoV-2 infection. Interpretation of study findings is limited by the observational design.

REFERENCES:

1. Goldshtein I, Nevo D, Steinberg DM, et al. Association Between BNT162b2 Vaccination and Incidence of SARS-CoV-2 Infection in Pregnant Women. *JAMA.* 2021;326(8):728–735. doi:10.1001/jama.2021.11035
2. https://www.rcog.org.uk/en/guidelines-research-services/coronavirus-covid-19-pregnancy-and-womens-health/covid-19-vaccines-and-pregnancy/covid-19-vaccines-pregnancy-and-breastfeeding/
3. Preliminary Findings of mRNA Covid-19 Vaccine Safety in Pregnant Persons
4. Gray, K. J., Bordt, E. A., Atyeo, C., Deriso, E., Akinwunmi, B., Young, N., Baez, A. M., Shook, L. L., Cvrk, D., James, K., De Guzman, R. M., Brigida, S., Diouf, K., Goldfarb, I., Bebell, L. M., Yonker, L. M., Fasano, A., Rabi, S. A., Elovitz, M. A., Alter, G., … Edlow, A. G. (2021). COVID-19 vaccine response in pregnant and lactating women: a cohort study. *medRxiv : the preprint server for health sciences*, 2021.03.07.21253094.
5. Woodworth, K. R., Olsen, E. O., Neelam, V., Lewis, E. L., Galang, R. R., Oduyebo, T., et al. (2020). Birth and Infant Outcomes Following Laboratory-Confirmed SARS-CoV-2 Infection in Pregnancy — SET-NET, 16 Jurisdictions, March 29–October 14, 2020. *MMWR Morb. Mortal. Wkly. Rep.* 69 (44), 1635–1640. doi: 10.15585/mmwr.mm6944e2
6. Zambrano, L. D., Ellington, S., Strid, P., Galang, R. R., Oduyebo, T., Tong, V. T., et al. (2020). Update: Characteristics of Symptomatic Women of Reproductive Age With Laboratory-Confirmed SARS-CoV-2 Infection by Pregnancy Status - United States, January 22-October 3, 2020. *MMWR Morb. Mortal. Wkly. Rep.* 69 (44), 1641–1647. doi: 10.15585/mmwr.mm6944e3
7. Yousaf, F., Mubeen, S., Javaid, A., Rafique, M. A., & Ramzan, H. S. (2021). IMPACT OF COVID-19 ON PREGNANCY OUTCOMES: A CROSS SECTIONAL STUDY. *International Journal of Medical Science And Diagnosis Research*, *5*(4). https://doi.org/10.32553/ijmsdr.v5i4.796
8. Khan S, Nabi G, Han G, et al. Novel coronavirus: how the things are in Wuhan. [Published online ahead of print, February 11, 2020.] Clin Microbiol Infect 2020; S1198–743X(20)30084-7. doi:10.1016/j.cmi.2020.02.005