Original Article

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Knowledge, Attitude and Practices towards COVID-19 Vaccine in Pregnant and Postpartum Women: A Cross-sectional Study

Obstetrics and Gynaecology Section

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ABSTRACT

Introduction: Pregnant and lactating women have been included in the ongoing vaccination drive against Coronavirus Disease 2019 (COVID-19) by the Government of India. Despite the fact, the vaccination rates among this particular group were fairly dismal.

Aim: To study the Knowledge, Attitude and Practices (KAP) related to the COVID-19 vaccine in pregnant and postpartum women in a tertiary care hospital.

Materials and Methods: This cross-sectional study was conducted in Obstetrics and Gynaecology wards and Outpatient Department, Smt. Kashibai Navale Medical College and General Hospital (tertiary care hospital), Pune, Maharashtra, India, from August 2021 to October 2021 among 251 pregnant and postpartum patients. The data was collected using a face-to-face questionnaire. The questionnaire included demographic characteristics of study participants and a set of questions to test the KAP towards COVID-19 vaccination in pregnancy.

Results: A total of 251 pregnant and postpartum women, with a mean age of 24.54 years, were surveyed. Among all the participants, 223 (89.92%) knew about the existence of the COVID-19 vaccine, however, only 23 (9.16%) were vaccinated. The most common reasons for refusing the vaccine were concerns for their own safety (n=39, 17.5%) or that of the foetus (n=107, 48.1%), lack of awareness (58.5%), and lack of recommendation by healthcare workers (63.5%). Only 67.8% of subjects believed in the efficacy of the vaccine. Overall, 16 (9.41%) women with no history of miscarriages or abortions had taken the vaccine, whereas, seven (9.33%) participants with a history of miscarriage or abortions had taken the vaccine.

Conclusion: The present study reported low acceptance of the COVID-19 vaccine in pregnant and postpartum women. Lack of awareness and concern for vaccine safety were the major reasons for this. Recognising the major reasons for vaccine hesitancy among this population will be useful for creating effective strategies to increase vaccine acceptance during this pandemic.

Keywords: Acceptance, Coronavirus disease 2019, Lactating women, Pregnancy

INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is an infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). This pandemic threatened the world for the last two years with its high infectivity and ever rising death rate. It is known that COVID-19 infection in pregnancy is associated with a significantly increased chance of hospitalisation, Intensive Care Unit (ICU) admission and a need for mechanical ventilation [1,2]. Pregnancy worsens the morbidity of COVID-19 which also seems to increase as the pregnancy advances, but the same does not apply for the mortality rate [3].

Vaccination was suggested by the World Health Organisation (WHO) as the most suitable approach to build herd immunity in a population [4]. Initially, pregnant and lactating women were not part of any clinical trial for COVID-19 vaccines and hence most countries kept them out of their immunisation drives. This has changed as it was found that women vaccinated during pregnancy did not experience higher adverse pregnancy or neonatal outcomes [5-7].

On July 2nd, 2021, the Union Health Ministry of India announced the inclusion of pregnant and lactating women in the ongoing vaccination drive against COVID-19 [8]. Yet, the number of women from this group who had taken the vaccine were low [9]. Knowledge, Attitude and Practice (KAP) studies regarding the COVID-19 vaccine in pregnant and lactating women have been conducted in countries like the United States (US), United Kingdom (UK) and China [10-12]. A common conclusion among all studies was present with the actual vaccination rates of pregnant women being low. The only differing point among the countries was the primary reason for declining the vaccine. The conclusion from these developed countries was essential to compare to developing nations such as India. However, there has been a lack of any similar studies in India. The present study will help us to study the Knowledge, Attitude and Practices (KAP) related to the COVID-19 vaccine in pregnant and postpartum women in a tertiary care hospital. The results of which will help to implement policies for increasing vaccine acceptance.

MATERIALS AND METHODS

The present cross-sectional study was conducted in Obstetrics and Gynaecology wards and Outpatient Department, Smt. Kashibai Navale Medical College and General Hospital (tertiary care hospital), Pune, Maharashtra, India, from August 2021 to October 2021 in 251 pregnant and postpartum patients. The Institutional Ethics Committee approval was obtained (Red. SKNMC/Ethics/App/2021/834-ethics approval no). Since this was a pilot study, an empirical sample size of 250 patients was taken.

Inclusion criteria: All pregnant and postpartum women visiting the Obstetrics and Gynaecology Department, who were willing to participate were included in the study. Postpartum women included mothers in the postpartum period up to six weeks postdelivery.

Exclusion criteria: Patients who were unable to take the survey due to severe medical co-morbidities or surgical complications were excluded from the study.

Study Procedure

Data was collected using a face-to-face questionnaire. The questionnaire was pretested on 10 patients after which few changes were made in the questions to make them easier to understand by the participants. Appropriate verbal consent was obtained before the survey. The questionnaire included demographic characteristics of study participants and a set of questions to test the KAP towards COVID-19 vaccination in pregnancy. Attitude was assessed using a questionnaire which could be answered as 'yes', 'no', or 'may be'.

The patients were divided into high-risk and low-risk pregnancies. Mothers with obstetric conditions like preeclampsia, multiple pregnancies, and gestational diabetes, and medical conditions like anaemia, hypertension, thyroid, and kidney disease were considered high-risk.

STATISTICAL ANALYSIS

Data were entered in Microsoft excel software and converted to Stata version 15.1 (© StataCorp, College Station, Texas, USA) for analysis. Authors estimated the means and standard deviation for linear variables, and proportions for categorical variables. The proportions across groups were compared using the Chi-square test or Fisher's-exact test for low expected cell counts. A p-value of <0.05 was considered statistically significant.

RESULTS

The study included a total of 251 survey responses from pregnant and postpartum women out of which 250 was taken as sample size. The mean age of females was 24.54 years with a standard deviation of 4.26 years, ranging from 18-37 years. Amongst these, 212 responders were pregnant women, and 38 were postpartum women. In terms of obstetric history, most pregnant women were multigravida (57.2%, n=143), in the third trimester of pregnancy (63.82%, n=127), and had no history of miscarriage (75.2%, n=188) [Table/Fig-1].

Age	n (%)
<20	14 (5.6)
20-25	125 (50)
25-30	73 (29.2)
30-35	29 (11.6)
>35	9 (3.6)
Mean (SD)	24.54 (4.26)
Frontline workers	
Yes	8 (3.2)
No	242 (96.8)
Vaccination status of frontline workers	
Vaccinated	3 (37.5)
Not vaccinated	5 (62.5)
Gravidity	
Primigravida	107 (42.8)
Multigravida	143 (57.2)
Trimester of pregnant women	
First	25 (12.56)
Second	47 (23.62)
Third	127 (63.82)
Number of living children	
0	138 (58.98)
1	94 (37.45)
≥2	19 (7.57)
Type of risk associated with pregnancy	
High	75 (29.88)
Low	176 (70.12)
COVID-19 vaccination status	
Had taken the vaccine	23 (9.16)
Had not taken the vaccine	227 (90.84)

[Table/Fig-1]: Socio-demographic features of patients N=250.

Knowledge and attitude related to the COVID-19 vaccine: Out of total, 223 (89.92%) females knew about the existence of a vaccine against COVID-19, however, only 145 (58.7%) felt that it could reduce the severity of infection [Table/Fig-2]. The vaccine was recommended by healthcare workers to only 33 (13.58%) subjects. One hundred and sixty five (68.05%) subjects mentioned

Question	No n (%)	Yes n (%)	May be n (%)
Knowledge questionnaire			
1. Do you think COVID-19 infection can cause severe illness?	14 (5.65)	233 (93.95)	1 (0.40)
2. Do you think COVID-19 infection can be dangerous to health?	41 (16.47)	186 (74.70)	22 (8.84)
3. Do you think COVID-19 infection can spread from person to person via droplet infection?	40 (16.13)	197 (79.44)	11 (4.44)
4. Do you think COVID-19 virus can spread from breast milk?	43 (17.34)	151 (60.89)	54 (21.77)
5. Do you know that there is a vaccine against COVID-19?	21 (8.47)	223 (89.92)	4 (1.61)
6. Do you think that the COVID-19 vaccination reduces the severity of disease?	26 (10.53)	145 (58.70)	76 (30.77)
7. Do you know that the COVID-19 vaccine is injected using a needle in your arm?	75 (30.49)	154 (62.60)	17 (6.91)
8. Do you know that the Government of India has made pregnant and lactating women eligible for COVID-19 vaccination?	110 (44.90)	133 (54.29)	2 (0.82)
9. Do you know that a pregnant woman who has been infected previously also needs to be vaccinated?	40 (16.33)	143 (58.37)	62 (25.31)
10. Would you take the vaccine if it was recommended by a healthcare professional?	168 (67.2)	82 (32.8)	0
11. Do you think that the COVID-19 vaccines are effective?	31 (12.65)	166 (67.76)	48 (19.59)
12. Do you think that the COVID-19 vaccine is effective for pregnant and lactating women?	33 (13.41)	117 (47.56)	96 (39.02)
13. Do you think that the COVID-19 vaccine is safe for you and your baby?	59 (24.08)	131 (53.47)	55 (22.45)
14. Do you think that the benefits of COVID-19 vaccine outweigh the risks?	34 (13.88)	148 (60.41)	63 (25.71)
15. Do you think the benefits of the COVID-19 vaccine outweigh the risks in pregnant and lactating women?	41 (16.73)	113 (46.12)	91 (37.14)
16. Do you think that vaccination can help eradicate the COVID-19 disease?	32 (13.17)	160 (65.84)	51 (20.99)
Attitude questionnaire			
1. Have you been recommended the COVID-19 vaccine by any healthcare worker yet?	210 (86.42)	33 (13.58)	0
2. Are COVID-19 vaccines easily available for pregnant and lactating women in your locality?	164 (68.05)	77 (31.95)	0
3. Have you received the tetanus vaccine during the course of the preg nancy?	30 (12.35)	213 (87.65)	0
4. Do you think that even after vaccination, we must follow safety precautions like wearing masks and social distancing?	7 (2.88)	220 (90.53)	16 (6.58)

[Table/Fig-2]: Details of the questionnaire and their responses.

that the vaccines were not easily available for pregnant women in their localities despite the government's notice to start vaccination among pregnant and lactating mothers. Only 117 (47.56%) females thought that the vaccine was effective in the pregnant and lactating population.

Practices related to the COVID-19 vaccine: Only 23 (9.16%) females had taken the vaccine. The most common reasons for refusing the vaccine were concerns for their own safety (n=39, 17.5%) or that of the foetus (n=107, 48.1%), lack of awareness (58.5%), and lack of recommendation by healthcare workers (63.5%). Only 67.8% of subjects believed in the efficacy of the vaccine. Not recommended by healthcare workers (n=141, 63.5%) and unaware of that pregnant and immediate postpartum women were now eligible for taking the vaccine (n=130, 58.5%). Only 67.8% of subjects believed in the efficacy of the vaccine.

Out of whom had taken the vaccine, 15 (65.22%) participants had only taken one dose while, 8 (34.78%) participants had taken both doses. No significant association was found between the history of miscarriage or abortion and vaccine acceptance [Table/Fig-3]. There was no association between age and vaccine acceptance. Twelve (45.83%) of the women in their first trimester had already taken the vaccine as compared to only two (4.44%) of those in their 2nd trimester, eight (6.35%) of those in their 3rd trimester and 2.7% (n=1) of the immediate postpartum subjects [Table/Fig-4].

Reasons for taking the vaccine (n=23)	n (%)
To protect me against COVID-19	17 (73.91)
To protect my child against COVID-19	8 (36.36)
It was recommended by my healthcare provider	6 (27.27)
Government notices and advertisements recommended it	7 (31.82)
I took it before my pregnancy	2 (9.09)
It was made compulsory by my employer	2 (9.09)

[Table/Fig-3]: Reasons cited by vaccinated pregnant and lactating women for taking COVID-19 vaccine.

Demographic details	
1) History of miscarriage/abortion	**Vaccine taken, n (%)**
Yes	16 (69.5%)
No	7 (30.4%)
Pearson Chi-square=0.0004, Pr=0.985	
2) Age group (years)	**Vaccine taken, n (%)**
18-20 years	1 (4.3%)
21-25 years	10 (43.4%)
26-30 years	7 (30.4)
More than 30 years	5 (21.7%)
Pearson Chi-square=5.9953, Pr=0.112, Fisher's-exact=0.096	
3) Trimester	**Vaccine taken, (%)**
First	12 (52.2%)
Second	2 (8.7%)
Third	8 (34.8%)
Immediate postpartum	1 (4.3%)
Pearson Chi-square=41.6998, Pr=0.000, Fisher's-exact=0.000	

[Table/Fig-4]: Association between the history of miscarriage/abortion, age, trimester and vaccine acceptance.

In a multiple-response question, most particpants wished to be given updates regarding the COVID-19 vaccine from either healthcare workers (n=208) or the television news (n=143), while only 84 participants opted for social media updates.

DISCUSSION

This is one of the first few cross-sectional, prospective KAP studies conducted in India in a tertiary care hospital which studied the COVID-19 vaccine acceptance in pregnant and postpartum women. The study included younger pregnant women, a majority of those being less than 30 years. A majority of the subjects believed that this disease could spread via vertical transmission. A greater proportion of the subjects knew about the existence of the vaccine and most believed in its efficacy. However, very few participants had taken the vaccine. Reasons for not taking the vaccine were lack of recommendation by healthcare workers, the possible harmful effects to the baby or the mother, lack of awareness, and the non availability of vaccines for pregnant women at vaccination centres. A significant fraction of women in their first trimester had already taken the vaccine as compared to the others. No significant correlation was found between the history of miscarriage/abortion and vaccine acceptance. Most of the patients prefer to receive updates on the vaccine via healthcare workers and television news over social media and other means. The postpartum women included in this study were only up to six weeks following delivery, most of whom had recently delivered. Their attitude and practices were similar to those of the pregnant women as they had recently delivered and not had the chance to get vaccinated postdelivery.

Interestingly, a majority of the subjects believed that this disease could spread via vertical transmission. However, the published data suggests there is no transmission of COVID-19 from mother to child in-utero or via breast milk [13,14]. A similar concern was seen in a study from China by Tao L et al., [10].

Most subjects in the present study were aware that COVID-19 can cause severe disease, yet very few had taken the vaccine. In the US, a study by Sutton D et al., showed that most women who were not willing to get vaccinated during pregnancy cited concerns about vaccine effectiveness [12]. In the study by Tao L et al., the reasons for refusing the vaccine were concerns regarding the safety and efficacy of the vaccine besides the overall refusal of all vaccines in general [10]. Similar to the present study, the participants in these studies had concerns regarding the safety of the vaccine.

The vaccine was recommended by healthcare workers to only a small number of the subjects which explains the vaccine hesitancy seen. Furthermore, most subjects had received the tetanus toxoid during pregnancy which shows that they are not hesitant to take other vaccines during pregnancy that were recommended to them by their healthcare providers.

Multigravida women seemed to have a higher acceptance rate as compared to primigravida mothers however this was not statistically significant. Vaccine acceptance was much higher among the subjects in their first trimester as compared to those in the 2nd and 3rd trimester as well as immediate postpartum mothers. This was surprising, as it was expected that mothers in the first trimester might have more resistance to the vaccine due to the concern that it may interfere with organ and tissue development in early pregnancies. It seems that participants believed that the vaccine may harm the foetus in the later stage of the pregnancy. Goncu Ayhan S et al., showed similar results in a study conducted in Turkey [15]. This was in contrast to a study by Tao L et al., where vaccine acceptance was higher in the third trimester of pregnancy while Pairat K and Phaloprakarn C found that the vaccine acceptance was higher in the second trimester [10,16].

Overall, 67.2% said they would take the COVID-19 vaccine during pregnancy, provided it was recommended by their doctors. This figure is comparable to different countries like the United Kingdom, where 59.2% of the subjects said they would accept a future vaccine during pregnancy. In a study conducted by Skirrow H et al., in the US, where 41% of women reported they would get a COVID-19 vaccine if one became available during their pregnancy [11,12]. In Turkey, this figure was 77% [15]. This is ironic, as the vaccine acceptance seems lower in developed countries. Out of the 250 women surveyed, eight were healthcare workers themselves but only three out of them had taken the vaccine at the time of the survey.

In the study by Skirrow H et al., concerns about the speed of development of the vaccine in context to the global pandemic, 'mistrust in government' regarding the handling of the COVID-19 pandemic and also 'mistrust in the wider pharmaceutical industry' were the reasons cited for not accepting the vaccine [11]. These concerns were not brought up by any of the subjects in the present study, while, the major concerns for rejecting vaccines were vaccine side-effects faced by the mother and foetus and the lack of awareness about the vaccine. This showcases the contrast between the concerns for rejecting the vaccine in developing and developed nations [12-16].

For those patients who had taken the vaccine, the reason of utmost importance for taking the vaccine was to protect themselves from the virus. This group seemed to have a better knowledge of the COVID-19 disease and vaccination as compared to the refusal group. This study showed the various gaps in the knowledge of pregnant and postpartum women with regards to the COVID-19 vaccine as well as the major causes of vaccine hesitancy in this population.

Limitation(s)

The drawbacks of this study were the small sample size and the lack of inclusion of educational and socio-economic background in the questionnaire.

CONCLUSION(S)

In conclusion, the present study reported low acceptance of the COVID-19 vaccine in pregnant and postpartum women. Lack of awareness and concern for vaccine safety were the major reasons for vaccine hesitancy. Recommendations by healthcare providers are integral in increasing the vaccination rates in this group. More active research on the safety of the vaccine in pregnant women, foetal and neonatal health will help reduce the reluctance to take the vaccine. Recognising the major reasons for vaccine hesitancy among this population will be useful for creating effective strategies and policies to increase vaccine acceptance during this growing pandemic. Creating a standard vaccine schedule for pregnant and lactating women will improve vaccine acceptance.

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