Research Article

Attitude towards COVID-19 Vaccine among Pregnant Women

Sikap terhadap Vaksinasi COVID-19 di Kalangan Ibu Hamil

Venkatesha K. Vasudevamurthy[1], Rashmi S. Desai[1], Ashwini H. Rmaswamy[2], Kasturi V. Donimath[1],Divyashree Bhat[1]

[1]Department of Obstetrics and Gynecology
[2]Department of Anesthesiology
Karnataka institute of Medical Sciences
Hubli Dharwad district Karnataka state
India

Abstract

Objective: To assess the perceptions and intentions of pregnant women regarding COVID-19 vaccination and to explore the reasons for vaccine hesitancy as well as acceptance.

Methods: This prospective cross-sectional study was conducted in tertiary care hospital in Karnataka. Around 811 pregnant women attending the antenatal clinic were recruited into the study. Data were collected using a face-to-face, anonymous questionnaire written in local language.

Results: Eighty six point two percent participants were aged 20 to 30 years and 64.6% had completed their schooling. 94.3% of them were homemakers and 58 % of the participants were in their third trimester. 65.5% of study group members lived in a COVID-supportive environment. Participants with COVID-19 vaccination awareness accounted for 87.4% and 65.4% were willing to receive the same whole heartedly. Our study found that 65.4% of participants were willing to receive covid-19 vaccine. The reasons for refusal were Lack of sufficient information regarding the vaccine, may be harmful to foetus and mother and lack of data proving its quality and efficiency.

Conclusion: Pregnant women in the North Karnataka region were highly receptive to COVID-19 immunization. Although a high level of awareness was apparent, the lack of data and fear of side effects were two major concerns for refusal. Confidence in the government and the availability of free vaccines for all have demonstrated a massive impact on vaccination.

Keywords: antenatal, covid-19, pregnancy, vaccination.

Abstrak

Tujuan: *Menilai persepsi dan keinginan perempuan hamil terkait vaksin COVID-19 dan alasan terkait penerimaan dan juga keraguan terhadap vaksin.*

Metode: *Penelitian ini merupakan penelitian potong lintang dengan pendekatan prospektif yang dilakukan di Rumah Sakit Karnataka. Perempuan hamil sebanyak 811 menjadi subjek penelitian. Data dikumpulkan menggunakan kuesioner yang dituliskan dalam Bahasa lokal dan pengumpulan data dilakukan secara tatap muka.*

Hasil: *Sebanyak 86,2 % sampel penelitian berusia 20 hingga 30 tahun dan 64,6% telah lulus sekolah. Sebanyak 94,3% sampel adalah ibu rumah tangga dan 58% dari sampel dengan usia kehamilan pada trimester ketiga. Sebanyak 65,5% grup tinggal pada kondisi. Sebanyak 87,4% sampel sadar akan keutamaan vaksin dan 65,4% bersedia mendapatkan vaksin. Alasan penolakan terhadap vaksin adalah kurangnya pengetahun mengenai vaksin dan ketakutan akan efek sampingnya.*

Kesimpulan: *Perempuan hamil di Karnatakan Utara terbuka terhadap imunisasi COVID-19. Disamping tingginya angka kesadaran akan imunisasi COVID-19, penolakan umumnya didominasi akibat kurangnya pengetahuan dan ketakutan akan efek samping. Keyakinan pada pemerintah dan ketersediaan vaksin secara gratis sangat berpengaruh pada vaksinasi.*

Kata kunci: *antenatal. covid-19, kehamilan, vaksinasi.*

Correspondence author. Vankatesha. Department of Obstetrics and Gynecology. Kartnataka Instituteof Medical Science. India. Email: venkikariganur@gmail.com

Received: December, 2021 Accepted: February, 2023 Published: April, 2023

INTRODUCTION

Worldwide, coronavirus disease 19 (COVID-19) has imposed large burdens of morbidity and mortality among the general population [1]. In the absence of an effective treatment for COVID-19, non-pharmaceutical interventions are the only available methods of disease control such as social distancing, face masks, and personal hygiene, however maintaining these actions are difficult on the long run. As a result, herd immunity by vaccination becomes the most effective eradication method, like in any viral epidemic diseases in the past. Vaccination has undoubtedly made a significant impact to human and animal health, notably in developing countries [2].

Pregnant women possess an increased risk of severe illness, intensive care unit admission and invasive ventilation when compared with non-pregnant patients of the same age. Therefore, Pregnant women are regarded as high-risk population in COVID-19 infection [3-6]. The incidence of covid 19 in our institute was 1.3% during our study period. Data the Covid-19 registry on pregnant and postpartum women shows that symptomatic cases were also significantly higher than that in the second wave with percentage of 28.7% and 14.3% respectively.

Given the risk-reward balance, a judgment call was taken in June 2021 by the ministry of health and family welfare of India to include the pregnant women in COVID 19 vaccination programme. The decision was based on the preponderance of probability and potential benefit of the mass use and protection towards pregnant women, especially given that COVID-19 infection is more severe in pregnancy. However, few studies revealed low acceptance rates for covid vaccine3.

Vaccine hesitancy is the reluctance of people to accept a vaccine in spite of its proven safety measures, efficiency and availability [7]. Vaccination coverage would be more extensive if we could better identify vaccination barriers in the population, especially among vulnerable groups, like pregnant women. Even the most effective vaccine would have a limited impact on the spread of a disease if people refused to take it. Few studies have been done in the recent past regarding the acceptance of covid vaccine but most of them were done in developed nations which are different in terms of family structure, income, education and awareness, accessibility to mass media, etc [6,7]. To identify the barriers of the acceptance of the vaccination, a questionnaire was designed differently by keeping all those differences in the mind. Identifying barriers among priority groups will help in planning vaccination strategies to increase uptake and contribute in fighting the pandemic 3. Our study aimed to assess the perceptions and intentions of pregnant women regarding COVID-19 vaccination and explore the reasons for vaccine hesitancy as well as acceptance.

METHODS

This prospective cross-sectional study was conducted in tertiary care hospital in Karnataka between September 2021 to December 2021. The hospital was a referral centre for covid infection as well as vaccination. Around 811 pregnant women attending the antenatal clinic were recruited into the study after the clearance by institutional ethical committee approval. Data were collected using a face-to-face, anonymous questionnaire written in local language and data collection preceded by a written informed consent. Participants were reassured about the confidentiality of the data. COVID-19 precautions were taken including the use of face mask, hand sanitation and physical distancing as preventive measures. Inclusion criteria were all pregnant women attending the out-patient clinic and willing to participate in the study. Exclusion criteria were patients with specific contraindications for COVID 19 vaccine, mental disabilities and communication disabilities.

As the infection and vaccination against covid-19 was a new of its kind, there was a paucity of validated tool during the study period. The questions prepared by the researchers themselves were used in the questionnaire. The questionnaire was created by the researcher contained 30 questions about sociodemographic characteristics, vaccination history, perception of risk related to the COVID-19 pandemic, the impact of the COVID-19 pandemic, and reasons for acceptance and denial for COVID-19 vaccination. The stage of pregnancy of the patients was based on the last menstrual period or first-trimester crown-rump length. High-risk pregnancy category includes preterm labor, hypertensive diseases of pregnancy, gestational diabetes mellitus, multifetal pregnancy, epilepsy, and placenta previa.

Sample size was calculated by convenient sampling method using openepi.com; an online sample size calculator. The sampling method

considered the pregnant population attending the out-patient clinic as well as the case load of covid 19 infection in pregnancy. With the 95% confidence interval and 5% margin of error the calculated sample was 400, we inflated the number to 811 to ensure an accurate and generalizable result. Discrete variables were represented as number and percentages. Statistical analysis was performed using SPSS 17 (SPSS Inc.,Chicago, IL, USA). The Shapiro–Wilk test and Kolmogorov–Smirnov test were used to determine the distribution of normality, and $\chi 2$ test was used to compare categorical data. Groups were compared with Spearman's rho test for correlation between sociodemographic variables and COVID-19 vaccine acceptance. A type-1 error below 0.05 was considered statistically significant.

RESULTS

The survey population represented a random sample of pregnant women attending the antenatal clinic in a tertiary care hospital. A total of 811 responses were obtained. Sociodemographic and clinical characteristics are presented in table 1. The largest group of participants (86.2%) was 20 to 30 years old and 64.6% had completed their schooling. Most of them were homemakers (94.3%) and 58 % participants were in their third trimester. 98.5% had no related comorbidities and 97.4 %were already vaccinated against tetanus. 44.9% had less than four family members and 71.4% denied the presence of school/college going children at home. Many participants (90.5%) were below the poverty line and 35.5% had no elderly people at home. 65.5% of study group members said that they live in a COVID-supportive environment. However, 98.2% denied any recent contact with COVID-19 patients. Participants with COVID-19 vaccination awareness accounted for 87.4% and 65.4% were willing to receive the same whole heartedly.

Table 1. Socio-demographic and Clinical Characteristics of the Participants

Characteristics	Category	No (%)
Age (years)	<20	38(4.7)
	20-30	699(86.2)
	30-40	72(9.1)
Education	Uneducated	33(4.1)
	school	524(64.6)
	college	172(21.2)
	Graduate	82(10.1)
Profession of the participant	Homemaker	765(94.3)
	Govt Job	18(2.2)
	Private job	28 (3.5)
Gestational age(wks)	<12	52(6.4)
	12-28	293(36.3)
	>28	465(57.4)
School/college going children at home	nil	579(71.4)
	1-2	121(14.9)
	>2	101(13.7)
Senior citizens at home	nil	288(35.5)
	1-2	231(28.5)
	>2	291(35.8)

Among participants who were willing to receive vaccine, 66.2% were 20-30 years old, 55.5% were educated with 66.5% home makers and 64% had low family income. Majority of them were in second and third trimesters with 81.8% being aware of the covid vaccine (Table 2).

Table 2. Attitude towards COVID-19 Infection and Vaccination

Characteristics	Categories	Willing to take vaccine/ vaccinated No(rows%)	Hesitant to take vaccine/ unvaccinated No(rows%)	*P-value*
		530(65.3)	281(34.7)	
Age (years)	18-20	27(71.1)	11(28.9)	0.06
	21-30	463(66.2)	236(33.8)	
	Above 30	38(52.8)	34(47.2)	
Education	Uneducated	15(45.5)	18(54.5)	0.29
	Schooling	334(63.7)	190(36.3)	
	College	124(72.1)	48(27.9)	
	Graduate	57(69.5)	25(30.5)	
Profession of the participants	Home maker	508(66.4)	257(33.6)	0.37
	working	22(47.8)	24(52.2)	
No of household members	<4	245(67.3)	119(32.7)	0.449
	4-6	160(61.5)	100(38.5)	
	>6	125(66.8)	62(33.2)	
Annual income	BPL	469(63.9)	265(36.1)	0.007
	APL	61(79.2)	16(20.8)	
Gestational age(weeks)	<12	38(73.1)	14(26.9)	0.063
	13-28	179(60.9)	115(39.1)	
	>29	313(67.3)	152(32.7)	
Covid prone working environment	Yes	185(66.1)	95(33.9)	0.754
	No	345(65)	186(35)	
is social distance possible?	yes	435(65.6)	228(34.4)	
	No	95(64.2)	53(35.8)	
Awareness of covid vaccine in pregnancy	yes	484(70.8)	200(29.2)	0.0
	No	46(36.2)	81(63.8)	

Among participants who denied vaccine, 76% were unaware of it and 94.3% lived below poverty line. Uneducated constituted 6.4% and 91.5% were home makers (Table 2). Number of household members were more than six in 23.6% of participants among willing to receive vaccine and 22% among denying pregnant women (Table 2). Among reasons for not taking vaccine, lack of sufficient information accounted for 54.4% with fear of adverse effects to mother rating second (20.3%). Other reasons were advice from the family members against vaccination (10.7%), fears of adverse effects to the foetus (8.9%), fear of injection (3.2%), worries regarding the side effects (1.4%) and unlikely to get covid infection (0.7%) and doubts regarding the vaccine (0.4%) 57.5% of participants opined that Asha workers informed them regarding vaccine and 31.6% received the same by their treating doctors. Source of information via media, family and friends constituted about 6.4% and 1% respectively.

DISCUSSION

This study was conducted in the declining phase of the second wave of COVID-19 infection in our region, where COVID-19 immunization has been approved for pregnant women in India. Our research uncovers the complex and interdependent factors around COVID-19 vaccine acceptance, denial, and the analysis of the underlying reason. Respondents who were unwilling to receive vaccine expressed three reasons for the refusal. The first one is the lack of sufficient information regarding the vaccine [3, 8,] teratogenic potential [9, 10] and insufficient data regarding the quality and efficiency. [8, 11-13]. Vaccination programmes can only be considered effective if they have a high level of acceptance and coverage. Our study found that 65.4% of participants were willing to receive covid-19 vaccine. This number exceeded the results in some of the studies[9-11,13-16] but not in some studies [17]. Few studies showed an acceptance rate of less than 25% [3,18-20]. The reasons behind this difference might be due to differences in access to health care services, different level of awareness regarding severity of infection and vaccination and different study population.

In contrast with some studies and consistent with the skjefte study, we found that women aged 20 to 30 years were more likely to get vaccinated [3,13,18,21]. In some part of the study showed that

the participants with low income were more inclined towards acceptance of the vaccine. This could be explained by, first, the fact that our government hospital is a tertiary care facility and that it provides services to low-income people to a greater extent. Secondly, the Government of India's decision to make the COVID-19 vaccine free for all Indian citizens could have played a huge role. A positive correlation was found between COVID-19 vaccine acceptance and number of school/college going children at home. This could be due to greater anxiety of transmission of infection to other family members via children [3,12]. Pregnant women in their second and third trimester were more willing to get vaccinated as compared with pregnant women in first trimester, these observations were in contrast. [3,22,23]

Unlike few studies, the majority of the participants willing to receive vaccines were educated (86%) and a few (10%) were graduates [9,12,13,24]. This may be due to the increased chances of being exposed to different media for an educate which fosters the awareness regarding vaccination. Our study discovered that immunization awareness among participants achieved through Asha workers accounted most followed by the same created by treating consultants. 30% of participants unwilling to get vaccinated were unaware of COVID-19 vaccine and 10% of them said they had family and friends who were objected to vaccination. This study brings the fact into light that in this world of rapidly spreading and easily available wrong information, it is imperative that awareness should be spread not only to the pregnant women but also to wider population who influences them effectively [9,25]. This could be done via mass communication media, reception areas in the hospital and so on.

Our findings show that trust in government is strongly associated with vaccine acceptance and can contribute to public compliance with recommended actions [18,26]. Clear and coherent communication from government representatives is crucial to strengthening public confidence in immunization programmes. Maternal mortality accounts for 2% of total covid deaths in India from February 2020 to June 2021, comprising one fifth of usual maternal deaths. The decision to allow vaccination of pregnant women against COVID-19 is a step towards achieving target 3.1 of sustainable development goals which aims to reduce global MMR (maternal mortality rate) of less than 70 per one lakh live births [27].

This study had some limitations. This survey is a snapshot taken at a point in time and was conducted in the context of a highly dynamic and changing landscape with rapid changes in the clinical presentation of the disease threat as well as fast track development of COVID vaccine itself. The strength of the study is its novelty and inclusion of large number of parameters.

CONCLUSION

Pregnant women in the North Karnataka region were highly receptive to COVID-19 immunization. Although a high level of awareness was apparent, the lack of prior knowlede and fear of having side effects were two major concern for the refusal. Continued public health efforts and vaccine safety awareness campaign would help overcome these barriers and encourage pregnant women to get vaccinated. Confidence in the government and the availability of free vaccines for all have demonstrated a massive impact on vaccination.

REFERENCES

1. Nersesjan V, Amiri M, Christensen HK, Benros ME, Kondziella D. Thirty-day mortality and morbidity in COVID-19 positive vs. COVID-19 negative individuals and vs. individuals tested for influenza A/B: a population-based study. Front Med. 2020; 7:1–10.
2. Greenwood B. The contribution of vaccination to global health: past, present and future. Philos Trans Roy Soc B Biol Sci. 2014 ;369: 20130433.
3. Goncu Ayhan S, Oluklu D, Atalay A, et al. COVID-19 vaccine acceptance in pregnant women. Int J Gynecol Obstet. 2021;154(2):291-6. doi:10.1002/ijgo.13713
4. Ward C, Megaw L, White S, Bradfield Z. COVID-19 vaccination rates in an antenatal population: A survey of women's perceptions, factors influencing vaccine uptake and potential contributors to vaccine hesitancy. Aust N Z J Obstet Gynecol. 2022;10.1111/ajo.13532. doi:10.1111/ajo.13532
5. Ellington S, Strid P, Tong VT et al. Characteristics of women of reproductive age with laboratory-confirmed SARS-CoV-2 infection by pregnancy status -United States. MMWR Morb Mortal Wkly Rep. 2020; 69 (25): 769–75.
6. Asalkar M, Thakkarwad S, Rumani I, Sharma N. Prevalence of Maternal Mortality and Clinical Course of Maternal Deaths in COVID-19 Pneumonia-A Cross-Sectional Study. J Obstet Gynecol Ind. 2022;72(3):208-17. doi:10.1007/s13224-021-01545-3
7. MacDonald NE; SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: Definition, scope and determinants. Vaccine. 2015;33(34):4161-4. doi:10.1016/j.vaccine.2015.04.036
8. Ward C, Megaw L, White S, Bradfield Z. COVID-19 vaccination rates in an antenatal population: A survey of women's perceptions, factors influencing vaccine uptake and potential contributors to vaccine hesitancy. Aust N Z J Obstet Gynecol. 2022;10.1111/ajo.13532. doi:10.1111/ajo.13532

9. Cerda AA, García LY. Hesitation and Refusal Factors in Individuals' Decision-Making Processes Regarding a Coronavirus Disease 2019 Vaccination. Front Public Health. 2021;9:626852.. doi:10.3389/fpubh.2021.626852
10. Egloff C, Couffignal C, Cordier AG, Deruelle P, et al. Pregnant women's perceptions of the COVID-19 vaccine: A French survey. PLoS One. 2022 Feb 7;17(2):e0263512. doi: 10.1371/journal.pone.0263512. PMID: 35130318; PMCID: PMC8820613.
11. Fakonti G, Kyprianidou M, Toumbis G, Giannakou K. Attitudes and Acceptance of COVID-19 Vaccination Among Nurses and Midwives in Cyprus: A Cross-Sectional Survey. Front Public Health. 2021;9:656138. doi: 10.3389/fpubh.2021.656138. PMID: 34222170; PMCID: PMC8244901.
12. Ghamri RA, Othman SS, Alhiniah MH, Alelyani RH, et al. Acceptance of COVID-19 Vaccine and Associated Factors Among Pregnant Women in Saudi Arabia. Patient Prefer Adherence. 2022;16:861-73. doi:10.2147/PPA.S357653
13. Skjefte M, Ngirbabul M, Akeju O, et al. COVID-19 vaccine acceptance among pregnant women and mothers of young children: results of a survey in 16 countries. Eur J Epidemiol. 2021;36(2):197-211. doi:10.1007/s10654-021-00728-6.
14. Woolf K, McManus IC, Martin CA, et al. Ethnic differences in SARS-CoV-2 vaccine hesitancy in United Kingdom healthcare workers: Results from the UK-REACH prospective nationwide cohort study. Lancet Reg Health Eur. 2021;9:100180. doi:10.1016/j.lanepe.2021.100180
15. Egloff C, Couffignal C, Cordier AG, et al. Pregnant women's perceptions of the COVID-19 vaccine: A French survey. PLoS One. 2022;17(2):e0263512. Published 2022 Feb 7. doi:10.1371/journal.pone.0263512
16. Danabal KGM, Magesh SS, Saravanan S, Gopichandran V. Attitude towards COVID 19 vaccines and vaccine hesitancy in urban and rural communities in Tamil Nadu, India - a community based survey. BMC Health Serv Res. 2021;21(1):994. doi:10.1186/s12913-021-07037-4
17. Tao L, Wang R, Han N, et al. Acceptance of a COVID-19 vaccine and associated factors among pregnant women in China: a multi-center cross-sectional study based on health belief model. Hum Vaccin Immunother. 2021;17(8):2378-88. doi:10.1080/21645515.2021.1892432
18. Lazarus JV, Ratzan SC, Palayew A, et al. A global survey of potential acceptance of a COVID-19 vaccine [published correction appears . Nat Med. 2021;27(2):225-8. doi:10.1038/s41591-020-1124-9
19. Sutton D, D'Alton M, Zhang Y, et al. COVID-19 Vaccine acceptance among pregnant, breastfeeding and non-pregnant reproductive aged women. Am J Obstet Gynecol MFM. 2021;3:100403. doi:10.1016/j.ajogmf.2021.100403
20. Battarbee AN, Stockwell MS, Varner M, et al. Attitudes Toward COVID-19 Illness and COVID-19 Vaccination among Pregnant Women: A Cross-Sectional Multicenter Study during August-December 2020. Am J Perinatol. 2022;39(1):75-83. doi:10.1055/s-0041-1735878
21. Blakeway H, Prasad S, Kalafat E, et al. COVID-19 vaccination during pregnancy: coverage and safety. Am J Obstet Gynecol. 2022;226(2):236.e1-236.e14. doi:10.1016/j.ajog.2021.08.007
22. Kunno J, Yubonpunt P, Supawattanabodee B, Sumanasrethakul C, Wiriyasirivaj B. Knowledge, attitudes, and practices related to the COVID-19 pandemic among pregnant women in Bangkok, Thailand. BMC Pregnancy Childbirth. 2022 ;22(1):357. doi: 10.1186/s12884-022-04612-3. PMID: 35461236; PMCID: PMC9034254.
23. Suzuki S, Eto M. Screening for Depressive and Anxiety Symptoms During Pregnancy and Postpartum at a Japanese Perinatal Center. J Clin Med Res. 2017;9(6):512-5. doi:10.14740/jocmr3035w
24. Suzuki S. Psychological status during the first trimester of pregnancy under the COVID-19 epidemic in Japan. J Matern Fetal Neonatal Med. 2022;35(15):3007-8. doi:10.1080/14767058.2020.1793319
25. Yancy CW. COVID-19 and African Americans. JAMA. 2020;323(19):1891-92. doi:10.1001/jama.2020.6548
26. Romer D, Jamieson KH. Conspiracy theories as barriers to controlling the spread of COVID-19 in the U.S. Soc Sci Med. 2020;263:113356. doi:10.1016/j.socscimed.2020.113356
27. Hovland, C. I. & Weiss, W. The influence of source credibility on communication effectiveness. Public Opin. Q. 15, 635 (1951).
28. Sarwal Y, Sarwal T, Sarwal R. Vaccination of pregnant women against COVID-19 in India and Indonesia: Moving beyond the opt-in to the opt-out option. Int J Gynecol Obstet. 2021 ;155(3):549-550. doi: 10.1002/ijgo.13930. Epub 2021 Sep 24. PMID: 34529276; PMCID: PMC9087546