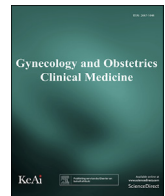




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Perspective

Overcoming barriers to COVID-19 vaccination of pregnant women

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ABSTRACT

COVID-19 in pregnancy is associated with an increased risk of severe maternal illness, ICU admissions, mechanical ventilation and deaths. Vaccination is the best way to protect pregnant women against these known risks of infection in pregnancy. There is an urgent need to prioritize strategic responses to optimize vaccination among expectant mothers. In this paper, we reviewed potential patient and healthcare provider barriers to COVID-19 immunization and propose effective strategies for overcoming them.

1. Introduction

Pregnant women are at higher risk of preterm birth and other adverse pregnancy outcomes with COVID-19 infection.¹ The pandemic added to poor global maternal and fetal cases, increasing stillbirths, maternal deaths, ruptured ectopic pregnancy and maternal depression.² The incidence of preterm delivery changed significantly during the pandemic, with soaring rates of preterm births and cesarean sections reported in women with COVID-19.³

As of August 9, 2021, there were 105,645 pregnant women with COVID-19 in the United States, contributing to a total of 18,008 hospitalized cases with 124 deaths.⁴ These adverse maternal and neonatal outcomes do not only cause mortality and morbidity but affect the overall well-being of pregnant women and their babies.⁵

Although COVID-19 is a new illness, some evidence suggests that expectant mothers are less likely to experience severe symptoms of the disease. The latest research findings indicated that pregnant women with COVID-19 need more intensive care than non-pregnant women.⁶ The association between pregnant individuals with COVID-19 and high rates of adverse outcomes is consistent.⁷ Therefore, COVID-19 vaccination is recommended for all people including pregnant women, breastfeeding mothers and women planning to get pregnant in the future.⁸ Evidence on the effectiveness and safety of vaccination suggests that receiving a COVID-19 vaccine outweigh any known or potential risk of vaccination during pregnancy.⁸ Current data support the immunogenicity and

effectiveness of the COVID-19 vaccines, and there is no evidence that they cause fertility problems in women.⁸ Leading medical organizations such as the American College of Obstetricians and Gynecologists (ACOG), American Academy of Family Physicians, American Academy of Pediatrics (AAP), American College of Nurse-Midwives strongly recommend the COVID-19 vaccines for pregnant individuals.⁹ Additionally, the COVID-19 vaccination builds antibodies that confer fetal and infant protection against the infection⁸ while babies can't receive the vaccine themselves.¹⁰ Thus, the newborn will arrive already protected from the deadly virus when ineligible yet for it.

Globally, all countries have individual policies in place concerning COVID-19 vaccination in pregnancy.¹¹ As of June 28, there are 45 countries permitting vaccination in pregnant out of 91 countries that admitted the policy.¹² Although these policies have made progress in increasing the uptake of the COVID-19 vaccines in pregnant women, it is vital to put strategies in place for sustaining and optimizing vaccination campaigns. Various patient and provider barriers exist to COVID-19 vaccination in pregnant women. This paper reviews these barriers and effective strategies for overcoming them.

2. Patient barriers to COVID-19 vaccination

Women considering future pregnancy or currently pregnant have concerns regarding the safety of the COVID-19 vaccine, which, remains a barrier to vaccination. Even though studies support the safety of the

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COVID-19 vaccines, many pregnant individuals have questions about whether to take the shots when offered to them. Several reported fears surround the COVID-19 vaccines among women in pregnancy.¹³

On top of them are miscarriages, birth defects, bad pregnancy outcomes, risk of infertility, change of menstrual cycles and the vaccine crossing the placenta.^{13,14} These concerns are based on analogies with no scientific theories or data backing them. Because pregnancy is a medical condition that excludes pregnant women from participating in clinical trials of the COVID-19 vaccine. People fear for the health of their unborn children or recommend them to their spouses since there are little data about the safety and effectiveness of the vaccine in human pregnancy.¹⁴ The unknowns of the new vaccines have not been tested in pregnancy, and initial studies are unable to guide pregnant women.¹⁵ There is also the assumption that the vaccine causes the body to attack syncytin-1, a protein in the placenta that shares a small piece of genetic code with the spike protein of the COVID-19 virus.¹⁶ The immune system would not be able to differentiate the two spike proteins, and placental protein attacked.¹⁷ The overall make-up of the placental protein is different from the spike protein of the coronavirus.¹⁷ These safety outcomes have been a major concern for many pregnant women considering the vaccine. A study of 1328 expectant mothers done in the UK between March 1, 2020 and July 4, 2021 revealed few pregnant women accepting COVID-19 vaccination with less than one-third having received at least one dose.¹⁸ Similarly, a prospective study conducted in Ankara City Hospital between January 1, 2021, and February 1, 2021, cited low acceptance of COVID-19 vaccination in a sample of pregnant women.¹⁹ Lack of safety data on COVID-19 vaccines in pregnancy and the possibility of harm to the fetus were the major reasons for hesitancy.¹⁹ In another survey of 135,968 pregnant women between December 14, 2020, to May 8, 2021, by the CDC, 16.3% (22,197) had received one or more doses of the vaccine with 5.3% (7154) initial dose and 11.1% (15,043) completed dose.²⁰

While poor awareness persists as an impediment to vaccination programs and acceptance, the situation is not the same for the COVID-19 vaccines. Information regarding the vaccine is rapidly evolving, well-tolerated and pregnant people do well with the vaccine.²¹ However, some pregnant women are still declining the vaccines because they are awaiting more evidence to reassure them that the vaccine is safe for their babies. A study done in the UK reported 58% of expectant mothers refusing the jabs due to insufficient evidence of safety.^{22,23} A related study conducted between February and May 2021 by the Royal College of Obstetricians among 1500 pregnant women stated that 40% plan not to get vaccinated, and 20% remained undecided because they need more evidence of reassurance.²² The hang-out for more robust evidence or data has left many pregnant women unsure about whether they should get vaccinated. Women waiting for sufficient scientific information before accepting the vaccine are inadvertently exposing themselves to increased risk of severe illness or death from the virus.²⁴

Assessing these attitudes and practices unveils that pregnant women are more vaccinated in some countries than others. Germany's standing committee on COVID-19 vaccination in pregnant women recommended the jabs only in some individual cases, with reasons that there are not enough data to support such a move as safe.²⁵ Pregnant women in India are still ineligible for COVID-19 vaccination due to government concerns and lack of safety data.²⁶ There are currently little safety data available for pregnant women on the two commonly approved local COVID-19 vaccines in India, namely, covishield and covaxin.²⁸ Also, lactating and pregnant mothers have been initially excluded from mass vaccination campaigns in most countries due to the same reasons, even though evidence for safety and efficacy is emerging.²⁷ The task of weighing the risk and benefits of vaccination is now left to the pregnant women to make a decision based on individual preferences or circumstances.

Reluctant toward the COVID-19 vaccines exist undeterred by high global awareness of infection rates, deaths and poor clinical outcomes.^{29,30,31} Many pregnant women are unconcerned and unmoved, knowing what to do to keep safe and healthy but not doing them. The

health belief model partially predicts these intentions and explain or address the reasons for the hesitancy. Beliefs in the threats of COVID-19 illness and the effectiveness of vaccination determine whether a pregnant woman will engage in the vaccination campaign or take it seriously. Pregnant women who are not accepting COVID-19 immunization do not believe in the threat of the virus or perceive any benefits from the vaccines, even if they are susceptible.³² Perceived benefits of vaccination and self-reported health outcomes are positive correlates of acceptance.³²

To overcome these barriers, awareness campaigns must be intensified than before to enhance the likelihood of acceptance among the pregnant population. Increasing risk perception and severity among pregnant and non-pregnant women is essential. For instance, pregnant women who contract COVID-19 are at risk to be admitted to ICU requiring ventilators due to cardiovascular and respiratory changes occurring in pregnancy.³³ A woman who contracts the infection is of great concern, especially with the delta variant. Some pregnant individuals will get vaccinated when they view themselves as being at high risk of significant suffering or complications should they get infected with COVID-19.³⁴ These campaigns should target young women, pregnant mothers, uneducated women and females who have not taken any COVID-19 vaccine even though they are not pregnant.

It is imperative that awareness campaigns also minimize the perception of these barriers by addressing the concerns of pregnant women about the effectiveness and adverse events of the vaccine in pregnancy. Concerning safety issues, the obstetric population must be reassured that COVID-19 vaccines are not live vaccines and vaccines based on live viruses are avoided in pregnancy because they affect the developing baby. Non-live vaccines throughout history have proved safe in pregnancy, and pregnant women are offered other non-live vaccines (flu). Besides, the COVID-19 vaccines have protective antibodies that cross the placenta to boost the baby's immunity against the infection, which explains the reasons why vaccination is encouraged.

There is no increased reaction in pregnant individuals beyond what is expected from the vaccine.³⁵ Data to date show no adverse maternal or fetal effects from vaccinating pregnant women with the vaccine. Currently, available vaccines are equally effective in pregnant and non-pregnant women.³⁶ Reports claiming that the vaccine can cause infertility or harm fetal development are unfounded.³⁶ There is no reason for pregnant women to be concerned about the safety of the vaccine, and women planning to get vaccination should have no reservations.³⁶ The non-pregnant population can also receive the COVID-19 vaccine even if they have not discussed it with a healthcare provider or have no intention of getting pregnant.³⁷ Arming pregnant women with the above reassuring information will support their decision-making. As far as perceived benefits of vaccines are thought effective to protect pregnant women, skepticism can be reduced to some degree.

Simultaneously, one of the most effective methods to deliver and launch these awareness campaigns is in the media. Pregnant women rely on different media sources like television, radio, newspapers, and social media for information on the prospects of the COVID-19 vaccine in pregnancy. These sources play critical roles in disseminating information easily and cost-effectively. While the media can fuel misconceptions, it can provide better guidance for pregnant women. The media can be used to draw more attention to promote public trust in the COVID-19 vaccines.

In an assessment of other factors highly associated with the acceptance of the COVID-19 vaccines, healthcare providers' recommendations were of particular relevance to the context of vaccination strategies.^{32,38} Much as preference and sociodemographic characteristics differ among pregnant women, the intention to vaccinate increases with the recommendation.^{39,40}

Strong recommendations make a meaningful difference for many pregnant people.⁴¹ During the influenza pandemic, one study reported that 68% of pregnant women would consult their obstetrician first before considering taking the influenza vaccine.⁴² In another study assessing this behavior, 89% of pregnant women expressed the interest to get vaccinated if their healthcare providers recommend it.⁴³ In 2009, the

study of influenza vaccination among postpartum women suggested that 60% participated at the recommendation of their obstetricians.⁴⁴ Based on these findings, a recommendation from a credible source remains an important driver of vaccination in the obstetric population. Since the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), healthcare providers and other regulatory authorities are seen as reliable sources of recommendation, they must increase their outreach to pregnant and young women intending to become pregnant. This strategy will increase vaccination coverage in this target population and promote confidence in the vaccine.

Over and above that, the frequency of scheduled antenatal visits where obstetric care providers routinely assess pregnant patients' vaccination status is paramount. Opportunities for discussions, screening, recommendations and vaccination can be created based on assessment. Trust establishment through these prenatal visits facilitate willingness to accept vaccination.^{30,45} Health care providers must take the opportunity to have a conversation about the benefits of COVID-19 vaccines at every prenatal visit.

The influence of subjective norms coming from peers must be considered.⁴⁶ Research done by Al-Jumaili et al., 2020 found that two-thirds of participants being studied were willing to vaccinate if their friends would get vaccinated first.⁴⁷ The chance of getting an expectant mother to vaccinate will increase if friends and family members advise so. In this perspective, pregnant women who have been vaccinated already must share their positive thoughts and experiences with the unvaccinated population. It conforms to the theory of reasoned action and the tendency in peers influence acceptance among others.⁴⁷ Nevertheless, vaccinated women must be encouraged to sign up for a vaccine registry where pregnancy status and baby outcomes are monitored safely.

With all these multifaceted strategies, there will still be some pregnant women declining vaccination. Willingness to consider vaccination varies by patient, and healthcare providers should actively listen to and validate the concerns and fears of these patients because getting vaccinated is a personal choice. Alternative methods for preventing COVID-19 infection in pregnancy should be advised, and care must be continuously be provided. These include wearing a mask, physical distancing and good nutrition to build natural immunity.

3. Healthcare provider's barriers to COVID-19 vaccination

Healthcare providers are long-standing essential partners in the recommendation and safe administration of vaccines.^{48,69} Positive attitudes toward immunization in pregnant women are reported with provider's recommendation for vaccination.^{49,50} They build confidence in patients who believe vaccinations are unsafe.⁵¹

In the event of emerging vaccine hesitancy, the most trusted influencer of vaccination decisions is the healthcare provider.⁵² However, some obstetricians –gynecologists and other healthcare workers are not leading by example by getting vaccinated. If healthcare providers are not vaccinated, they will not encourage eligible patients to be vaccinated as well.^{53,54} Findings from a survey in Israel revealed that the percentage of people who intend to obtain the COVID-19 vaccine was 78% among physicians and 61% among nurses.⁵⁵ In a related development, the acceptance of the COVID-19 vaccines among nurses in Hong Kong was low.^{56,57} Whereas in the United States, only 36% of health professionals expressed interest to take the vaccine when they are made available in late 2020.⁵⁸

To boot, there are other reasons compelling healthcare providers from accepting the COVID-19 vaccine or recommending them to their pregnant population. Lack of safety data for the vaccine in pregnancy, unawareness of current guidelines, and concerns of potential teratogenicity (adverse effects) on maternal physiology and the fetus among other things point inadequate knowledge of vaccine recommendation.

Along with these reasons, studies have shown that some healthcare professionals have negative perceptions with safety concerns about the

COVID-19 vaccines in general. In Nepal, healthcare workers had poor perception scores about the vaccines, and they were not willing to be vaccinated.⁵⁹ Vaccine hesitancy was noted among nurses of an inner-city hospital in New York City, and the major concern cited was the remarkable speed with which the vaccines move from bench to bedside.⁶⁰ These gaps in knowledge and perceptions contribute to a low rate of vaccination in the general and pregnant population.

Coupled with that, previous studies have indicated many physicians do not see vaccination of pregnant women as their usual practice. Shrag et al. uncovered that some obstetricians-gynecologists believe vaccination should be administered to expectant mothers by an internist, family practitioner and the health department.⁶¹ In summary, there is a significant proportion of obstetricians-gynecologists with other health practitioners who persist, not considering immunization as a component of their routine practice.

Given the role as a source of care for pregnant women,⁶² people look to them for information about vaccination; hence, nurses, physicians, pharmacists, and other healthcare workers must accept the vaccine and get vaccinated.^{63,64} They must set a good example and practice what they preach.^{63,64} Patients rank their healthcare providers as the most trusted source of vaccine information, and is critical for vaccine acceptance.⁶⁵ This trusted behavior conveyed can influence unvaccinated pregnant women and their families to consider vaccination. Patients can manage their mixed feelings and move toward healthy behavior changes consistent with the values of their providers.^{66,67}

Likewise, obstetricians-gynecologists and other obstetric care providers should routinely assess the vaccination status of their pregnant clients. Based on these assessments, they should recommend and where possible administer the COVID-19 vaccines to their clients.^{68,69} Computer record reminders and recall systems that appear in patient electronic records will aid in performing this task.

Moreover, all healthcare providers supporting COVID-19 vaccination efforts must receive ongoing training, guidance and reference materials as new recommendations concerning the vaccine in pregnancy evolve. Sponsored postgraduate courses, online resources, grand rounds and seminars should be organized to improve service delivery. These educational tools should provide current reports, publications and more data about the safety and efficacy of the COVID-19 vaccine in pregnancy.

Health practitioners as well have the responsibility to always look for guidance from credible sources such as the WHO, CDC, Royal College of Obstetrician and Gynecology, Royal College of Midwives, the American College of Obstetricians and Gynecologist, FDA, the Society for Maternal-Fetal Medicine to be armed with recent information to support women's decision-making.^{22,69} Additionally, the COVID-19 immunization among pregnant individuals need regular evaluation by providers together with feedback on vaccination performance to create awareness for modifications and safety. Incentives to motivate healthcare providers can change ill behavior and incite action. While all these intercessions are put in place, our healthcare institutions must receive adequate supplies and availability of the COVID-19 vaccines for pregnant women.

Nevertheless, the implantation of a standing order to enable nursing staff to administer the COVID-19 vaccines to pregnant can be another resort. This strategy is the most effective method for increasing vaccination rates in adults without the involvement of physicians.⁷⁰ Equally, health organizations can use other non-physician staff to identify and deliver services to pregnant women eligible for COVID-19 vaccination.⁷¹ For the future, prospective development of any vaccine and their clinical trials must include pregnant women to provide enough evidence for this patient population.

4. Conclusion

Pregnant women are at an increased risk of getting severely ill and fatal complications if contracted by the COVID-19 infection. Therefore, vaccination is the most effective way to mitigate the burden of the infection. Recognizing and addressing patient and healthcare barriers is

beneficial to pregnant women.⁷² In addressing these barriers, healthcare providers have the responsibility to be vaccinators, patients receive guided recommendations for vaccination and the interventions proposed should be explored.

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Declaration of competing interest

There is no conflict of interest to declare.

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