Clinical Pearl: What About The Coronavirus Vaccine for Pregnant Women?

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The Coronavirus 19 pandemic continues, and investigators from all over the world are working hard to characterize the short and long-term effects of COVID-19 infection/disease in adults, children, pregnant women, their fetuses, and newborn infants. This data is available to clinicians daily via the World Wide Web (www) as discussed in our last two clinical pearls with help from data scientists Tatiana Anderson and Kelty Allen (1,2). Now that the coronavirus (SARS-CoV-2) vaccine is becoming available, recommendations about the administration of the vaccine for pregnant women are being made by maternal-fetal medicine specialists (3-6).

"Now that the coronavirus (or SARS-CoV-2) vaccine is becoming available, recommendations about administering the vaccine for pregnant women are being made by maternal-fetal medicine specialists (3-6). "

This is the recommendation from the Society for Maternal-Fetal Medicine (SMFM) in their statement from 12/1/2020 regarding vaccination in pregnancy (3-6), which I learned about during our most recent Illinois Perinatal Quality Collaborative (ILPQC) COVID-19 Zoom webinar:

"Despite the categorization of pregnancy as a high-risk condition for severe COVID-19, hospitalization, and mortality, pregnancy remains an exclusion for participation in vaccine trials. The Society for Maternal-Fetal Medicine (SMFM) and other leading organizations, including the National Academy of Medicine, have consistently advocated for the inclusion of pregnant and lactating women in vaccination trials, particularly when the following criteria are met: (1) pregnancy poses increased susceptibility to or severity of a disease; (2) the best approach to protecting the infant is through passive placental antibody transfer, which provides the most efficient and direct protection to the newborn before an infant can be vaccinated, and (3) there is an active outbreak. Ultimately, the existing practice of "protection by exclusion" is harmful and has been characterized as clinical experimentation on pregnant women, as vaccines are distributed and administered without the safeguards of research protocols in place. Furthermore, there is no biological plausibility for the exclusion of lactating women from these trials.

In general, SMFM strongly recommends that pregnant women have access to COVID-19 vaccines in all phases of future vaccine campaigns and that she and her healthcare professional engage in shared decision-making regarding her receipt of the vaccine. Counseling should balance available data on vaccine safety, risks to pregnant women from SARS-CoV-2 infection, and a woman's individual risk for infection and severe disease. As data emerge, counseling will likely shift, as some vaccines may be more suitable for pregnant women. **mRNA vaccines**, which are likely to be the first vaccines available, do not contain a live virus but rather induce humoral and cellular immune response through the use of viral mRNA. Healthcare professionals should also counsel their patients that the theoretical risk of fetal harm from mRNA vaccines is extremely low.

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SMFM recommends that healthcare workers, who are considered prioritized for vaccination, be offered the vaccine if pregnant. A report by the National Academies of Sciences, Engineering, and Medicine entitled Framework for Equitable Allocation of COVID-19 Vaccine recommends that high-risk workers in health facilities or first responders should be among the first to receive the vaccine. Although pregnant women are not explicitly targeted in this framework, pregnant and lactating women who are otherwise eligible hould be offered the vaccine" (3-6).

These vaccines employ novel next-generation platforms consisting of either vaccine expression from the nucleic acid construct, as in the mRNA-based Moderna and Pfizer vaccines, or using a viral-vector, as in AstraZeneca's vaccine. AstraZeneca's use of a viral-vector is similar to the mechanism used in the Ebola vaccine, which is the only regulated vaccine using these next-generation

platforms. The Ebola vaccine has been administered during pregnancy and thus far has an acceptable safety profile (7-9).

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Several important points are emphasized from the information in this statement and other available clinical research and recommendations:

1. Pregnant women are now included in the high-risk group of severe SARS-CoV-2 disease.
2. The exclusion of pregnant women in the COVID-19 vaccine trials is a problem as it relates to having vaccine tested, data analyzed, and efficacy and safety established for the pregnant population.
3. Data from other vaccines produced with mRNA viral material suggests this type of vaccine is safe for administration to pregnant women. The theoretical risk to the fetus is very low.
4. The passive antibody transplacental transfer is the best way to protect the newborn infant before the infant can also be immunized. At this time, infants have also not been included in vaccine trials.
5. In addition, lasting immunity is not known at this time. But the importance of protection at the height of this pandemic is crucial.

It is also widely known that a single dose of the seasonal inactivated influenza vaccine given during pregnancy will induce maternal seroconversion and seroprotection, lessen the severity of any illness, decrease the risk for poor obstetric outcomes, and lower rates of influenza-like illness among newborns (10). The same may be able to be said of the COVID-19 vaccines' benefit to mother and fetus.

With the availability of more data, it is clear that maternal complications are common in pregnant women infected with SARS-CoV-2. Most commonly is pneumonia; however other reported complications include premature rupture of membranes (PROM), preterm deliveries, fetal distress, increased cesarean deliveries, gestational hypertension, diabetes, pre-eclampsia, placenta previa, oligohydramnios, polyhydramnios, hypothyroidism, and abnormal umbilical cord. Fetal complications include preterm birth, fetal distress, intrauterine growth retardation, stillbirth, neonatal death, and neonatal asphyxia (11). These complications during pregnancy can and do lead to future complications for the mother and unborn child.

Including pregnant women in the study of and administering the COVID-19 vaccine when the vaccine is available is likely to prevent future illness and associated morbidities.

Following SMFM recommendations, appeals to NIH and the US food and drug administration have been made to reverse the exclusion of pregnant from their ongoing trials, and pregnant women should have the same autonomy that other adults have in participation in trials for COVID therapeutics and vaccines. As stated above, this population is underrepresented and needed to establish efficacy and safety data (12).

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