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Pregnancy in the Time of COVID-19: What Are the Challenges for Maternity Care?

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Guest: Dr. Lisa Hui is an Associate Professor at the University of Melbourne and the Mercy Hospital for Women in Melbourne, Australia.

Bob Barrett: This is a podcast from *Clinical Chemistry* sponsored by the Department of Laboratory Medicine at Boston Children's Hospital. I'm Bob Barrett.

Pregnancy is a period of profound physiological and psychosocial adaptation under normal circumstance. The onset of the COVID-19 pandemic in early 2020 presented unique challenges for the maternity sector globally. Pregnant women are known to be more vulnerable to severe complications from respiratory infections due to physiological changes in their immune, cardiorespiratory and hematological systems. The immediate concern in 2020 was for the safety of pregnant women and preventing high rates of morbidity and mortality.

Our fears for maternal health were compounded by uncertainty around mother-to-child transmission of SARS-CoV-2 and the impact of SARS-CoV-2 on fetal development, obstetric outcomes, and newborn health. While there was rapid progress in establishing trials to develop therapies and vaccines for COVID-19, pregnant women were excluded from many of these early studies, thus limiting the evidence base for clinical care and vaccine hesitancy was more pronounced among pregnant women in many countries.

And last but not least, hospital visitor restrictions. The perception of hospitals as hotspots of infection, social distancing reduced in-person care and in some countries routine separation from the baby after delivery created psychosocial stresses for mothers and their families.

In a Q&A feature appearing in the March 2020 issue of *Clinical Chemistry*, global experts in perinatal epidemiology, maternal fetal medicine, maternal and child health, and vaccine uptake discussed the challenges in caring for pregnant women and their newborns during the pandemic and the progress that has been made.

We are pleased to have the moderator of the Q&A feature as our guest in this podcast, Dr. Lisa Hui, is an Associate Professor at the University of Melbourne and the Mercy Hospital for Women in Melbourne, Australia. She has special interest in perinatal infections and epidemiology and has been leading a citywide project to monitor the indirect impacts of

the COVID-19 pandemic on maternal and newborn outcomes in Melbourne.

So first of all, Dr. Hui, what were the major challenges for maternity clinicians during the COVID pandemic?

Lisa Hui: Well, as we all know, pregnancy and childbirth doesn't stop during a pandemic. And I think for maternity clinicians, we had the kind of dual challenges of having to continue to deliver the same number of births that we were used to, while working in an atmosphere of fear and uncertainty.

So, our prior experience with other similar viruses such as MERS and SARS-CoV-1 made us very concerned that COVID-19 could have a very serious impact on maternal mortality. So we were very concerned initially about an excess in maternal deaths in the early period and dealing with that in an atmosphere where we were also having to have the same number of hospital admissions for births and trying to protect staff and patients from infection was an extremely stressful period.

And of course, we are working in an environment where there was very little data about the impact of COVID-19 on pregnant women and so we were really in the early days unable to provide any sort of reassurance to pregnant women about the impacts of infection. And of course in pregnancy, there's also a second consideration and that's the impact on the unborn baby and we know that there are some viruses such as the Zika virus, which can cause very severe birth defects and we had no information about the impact of the Coronavirus on human development.

So these were all the things that we had to deal with, the fear of our pregnant women, the fear of our staff with continued workload coping with the changes to how we deliver healthcare, and then also addressing fears about the impact on the baby. We also had to change the way we delivered care to account for all of these things, including moving to telehealth in a lot of high income settings and having to try and deliver the same quality of care with less face-to-face interaction with pregnant women.

Bob Barrett: What do we now know about the impact of COVID-19 infection on the unborn and possibly more important, what do we still not know about it?

Lisa Hui: We now know that transmission of the virus before birth is extremely rare and that was based on information that came out very quickly in 2020. I think one of the heartening things about the pandemic was how collaborative and how dedicated our clinicians and researchers were to creating the data to help us inform our patients and guide our care. So, we do

know that transmission across the placenta is very rare and that of the perinatal transmission occur soon after birth through close contact with mother.

However, we do know that there is an indirect impacts on unborn babies if a woman gets infected during pregnancy, if a woman becomes symptomatic and very ill with COVID-19, then there's a higher risk of preterm birth. Some of that is medically indicated preterm birth to help relieve the stress on the maternal respiratory system, and there's also a higher rate of cesarean sections, hypertensive disorders of pregnancy and venous thromboembolic disease.

There's also information from the United States from the CDC from late last year showing that there is a higher rate of stillbirth amongst women, who are infected and this is believed to be related to specific features of the Delta variant. We do know that there are these adverse impacts that are not directly related to viral infection before birth and there's no increase in the rate of congenital anomalies, but obviously if a mother becomes unwell, it's going to have some impact on their unborn baby.

What we don't know is whether they're a long-term impacts on children after their mothers had COVID-19 in pregnancy or if they have acquired it in the newborn period through breastfeeding or close contact. That data will take some while for us to collect and to understand but as with many other aspects of this pandemic, we're going to have to wait for the long-term outcomes to be available.

So at the moment, we don't have major concerns about sort of a long COVID syndrome in newborns or children, but we do know that children respond quite differently to the virus than adults so that information will still take a while for us to obtain.

Bob Barrett: Doctor, are the medical treatments commonly used in non-pregnant adults generally safe for pregnant females?

Lisa Hui: Yes. So I think one of the messages that the maternity sector has been trying to convey to our colleagues in general medicine and in intensive care medicine is that many of the commonly used medications used in non-pregnant adults are safe in pregnancy.

For example, steroids such as Dexamethasone have been used for decades in pregnant women and we know that the monoclonal antibody therapies are also beneficial and can be used in pregnancy. Remdesivir is also considered safe and beneficial. So, initially there was a real paucity of data on treatments in pregnant women because they were systematically excluded from most of the early COVID-19

therapy trials and that's one of the unfortunate consequences of everyone's quite understandable concern about the impacts of new drugs on the fetus.

However, the impact of that concern is that pregnant women don't receive the same standard of care as non-pregnant people and we're not able to provide evidence-based care. So as the maternity sector, this pandemic has been a real call to arms to advocate for generating evidence in a safe and responsible way in the pregnant population.

Bob Barrett: Well, one of the biggest fears were about the COVID-19 vaccines and their safety in pregnancy. Are they safe to receive in pregnancy? And how does the vaccine uptake among pregnant women compare with the uptake in non-pregnant adults?

Lisa Hui: And I'm very happy to say that the COVID-19 vaccine is now known to be safe in pregnant women. More than 250,000 pregnant women have been vaccinated in the UK and the United States and there have been no safety concerns about the vaccine in these women. We know that the vaccine doesn't cross the placenta, but the protective antibodies that the woman produces in response to the vaccine do cross the placenta and they are detectable in cord blood of infants at birth.

So we do think that there's the benefit to both mother and potentially baby from being vaccinated in pregnancy. It certainly has been shown that vaccination has reduced ICU admissions among pregnant women who are infected with COVID-19. So we're trying to give a very clear message to pregnant women that vaccination is safe and beneficial and that not being vaccinated is not the safest thing for themselves or their babies.

In terms of vaccine uptake, there was a great deal of hesitancy amongst the pregnant population and indeed their clinicians about vaccination in pregnancy and that was because the vaccine was developed very quickly and that perhaps undermined people's confidence in the safety of the vaccine. However, there's lots of information now to show that it is safe in pregnancy.

The uptake, unfortunately, among pregnant women still lags behind that of the non-pregnant adult population. In the UK and the USA less than 50% of women giving birth in the second half of 2021 had received any vaccination for COVID-19. Fortunately here in Melbourne, where I work, our uptake is higher. So we've got almost 80% of women giving birth at the end of 2021 having received at least one dose of the COVID-19 vaccine.

So I think there are lots of things that kind of explain that very stark difference between the UK and the USA. We have a Universal Health Care System here in Australia, and we have pre-existing rates of influenza and pertussis vaccination in pregnancy, which are very good so up to 80 to 90% uptake of those vaccinations in pregnancy. So there was a good pre-existing confidence in the whole concept of vaccination in pregnancy in Australia, and we tried to do as much as we could to minimize barriers to vaccination.

So we have managed to have steady improvements here but unfortunately that hasn't been the experience globally and there's even I'm sure much lower rates of vaccination in pregnancy in low-income settings. And we have very little data from those countries to tell us what's happening but I'm sure the inequities in health that we see even within a high-income setting and magnified in low-income regions.

Bob Barrett: Well finally, Dr. Hui, what have been the commonly experienced indirect impacts of the pandemic on maternal well-being during pregnancy and childbirth?

Lisa Hui: So of course, childbirth is not just a medical event. It's a profound psychosocial event in any family's life. So for women in high-income settings, there were big disruptions to the delivery of healthcare that appear to have manifested in increases in stillbirth not directly related to maternal infections with COVID-19, but perhaps less access to healthcare or reluctance to present for concerns during pregnancy.

And in low-income settings, there's also been increases in both maternal and perinatal mortality. So with disruption to the delivery of maternal healthcare might actually end up causing more indirect deaths and direct deaths. It's been a major challenge to maternity clinicians everywhere and from a global health perspective, the pandemic has meant that the sustainable development goals that we had for maternal and neonatal mortality and not going to be met because health resources have been completely diverted away from that to dealing with the immediate needs of the pandemic.

In our own setting here, and I'm sure it's reflected elsewhere, we've seen a very severe impact on mental health of women. They've been missing out on all the usual social supports around having a baby, including having visitors in the hospital, having their children involved in visiting after giving birth in hospital, and obviously the switch to remote care models such as telehealth.

So these have all had and particularly the restrictions on support, the number of support people in labor and the number of visitors in the postnatal period has had a

significant impact. We've seen a drop in exclusively breastfeeding rates in our city and I think that's because of the emphasis on early discharge from the hospital and perhaps also lack of social support within the hospital as well from family members, who might be able to provide additional assistance with supporting breastfeeding.

Of course, there are other psychosocial impacts on pregnant women. We know that there's been a lot of financial insecurity for families, practical barriers to child care, and education for other children, and an increase in family violence and other things that occur during periods of great stress such as this. So the effect on mental health I think is going to have a lasting impact for all of us and the pandemic has essentially been a stress test and it has exposed a lot of vulnerabilities of our society and our healthcare systems.

We have also seen an increase in babies born before arrival to hospital in our city and that suggests that women are still reluctant to come into hospital in early labor and that means we have to work a bit harder to create more confidence that hospitals are a safe place to come and we also need to be careful not to create barriers to appropriate care out of concerns of reducing the risk of infection for the patients for the staff members.

Bob Barrett: Does that mean there were more babies being born in the backseat of cars?

Lisa Hui: Yes. It does. In Melbourne, at least, yes, either in the car park of the hospital or on route to the hospital. So yeah, that was a bit of an unexpected finding for us. But something we're working hard to reduce.

Bob Barrett: That was Dr. Lisa Hui from the University of Melbourne and the Mercy Hospital for Women in Melbourne, Australia. She was moderator of the Q&A feature in the March 2020 issue of *Clinical Chemistry* on Pregnancy in the time of COVID-19 and the Challenges for Maternity Care. She has been our guest in this podcast on that topic. I'm Bob Barrett. Thanks for listening.