

Pregnancy, Childbirth, Breastfeeding and Coronavirus Disease: What is Known So Far?

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ABSTRACT

COVID-19 which was officially declared pandemic on 11th March 2020 by the World Health Organization (WHO) has resulted in thousands of deaths globally. Since it's a new disease which was known since December 2019, there are limited evidence available on whether pregnant women are at higher risk of getting Coronavirus Disease (COVID-19) than the general public and the evidence of transmitting the virus from mother to baby is inconclusive.

This review article aims to capture the current evidence regarding pregnancy, childbirth, breastfeeding and COVID-19. The review included articles that discuss pregnancy and childbirth during COVID-19, available in English language and published between December 2019 and August 2020.

All women have the right to high quality maternity care, regardless of their COVID-19 status. During pregnancy and childbirth, women have the right to be treated with respect, dignity, confidentiality, information and informed consent; the right to the highest attainable standard of health, and freedom from discrimination and ill-treatment.

The paper presents three major themes linking COVID-19 with: (1) pregnancy, (2) childbirth and (3) breastfeeding. Followed by two alerts, one to clinicians: with the current focus on COVID-19 do not to ignore other public health issues affecting pregnant women and new mothers. Secondly, reminder to policy-makers and politicians: measure to reduce the risk of spreading COVID-19, such as self-isolation and avoiding public spaces and public transport can lead to an increase in other risk factors for pregnant women, including worse mental health and lower uptake of preventative services such as antenatal care and institutional birth.

Key words: Breastfeeding; Childbirth; Covid-19; Coronavirus; Pregnant women

INTRODUCTION

On December 2019 an outbreak of novel coronavirus (COVID-19) started in Wuhan, China and rapidly became a public health threat.¹ Only three months after the outbreak began, the World Health Organization (WHO) officially declared COVID-19 as a pandemic on 11th March 2020.² As of August

10, there have been 21,240,915 confirmed cases and -760,320 deaths globally due to COVID-19.³

METHODS

This review article aims to capture the knowledge regarding pregnancy, childbirth, breastfeeding and coronavirus disease (COVID-19). The literature search was conducted using search

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terms: 'breastfeeding', 'childbirth', 'COVID-19', 'pandemic' and 'pregnancy'. Database used for the literature search were Medline, Google scholar, WHO and Center for Disease Control and Prevention (CDC) website. The articles that discussed pregnancy, childbirth and breast feeding during COVID-19, available in English language and published between December 2019 and August 2020 were included.

Risk of COVID-19 for pregnant women

With the limited available evidence, it is currently not known whether pregnant women are at higher risk of getting COVID-19 than the general public.⁴ However, during pregnancy the immune system becomes less aggressive so as not to attack the genetically different baby growing inside the mother, making mother more susceptible to infections. When pregnant women do get this disease, it could be more severe especially in the second and third trimester, as the size of chest cavity decreases leaving lungs with less space to function due to growing womb.⁵ Critical care management (such as airway management) of pregnant women is much more difficult.⁶ The data from other viral illnesses such as influenza, Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS), suggests pregnant women are more likely to develop viral pneumonitis with higher morbidity and mortality.^{4,6} Higher risk of miscarriages was also reported during the first trimester during the SARS epidemic.

The International Society of Infectious Disease in Obstetrics and Gynaecology (ISIDOG) has classified pregnant women to be at high risk for severe illness with COVID-19 because the altered immune response may be higher, disease course may be severe and delivering intensive care is more difficult.⁶

Effects of COVID-19 on pregnant women and their babies

The data available on maternal outcomes in COVID-19 is limited and the evidence of transmitting the virus from mother to baby is inconclusive. To date only one study suggested that

COVID-19 can pass from an infected mother to her foetus, no major harmful effects was recorded in the babies.⁷ More studies have not found evidence of vertical transmission, for example Schwartz 2020, studies 38 pregnant women with COVID-19 in China whilst Chen et al. 2020, had the similar findings from a small clinical study of COVID-19 infection in nine pregnant women in China.^{8,9}

Current data also show that morbidity and mortality for pregnant women with COVID-19 is lower compared to the SARS epidemic. The disease tends to be mild and similar to non-pregnant women and the symptoms are usually similar to flu, with cough and occasionally dyspnea.^{5,6} So far, no cases of first trimester miscarriages has been published, but further research is necessary.⁶ There is also some evidence that the presence of comorbidity, such as obesity, high blood pressure and diabetes in pregnant women had more severe infections.⁵ The ISIDOG guidelines suggests protecting pregnant women above 24 weeks of gestation age from infection and advises removing pregnant women working in high risk exposure workplaces.⁶

Table 1 Key Measures to Prevent the Spread of COVID-19 to Pregnant Women

- Social distancing –remain at least six feet from anyone who doesn't live with you
- Hand washing with soap and water for at least 20 seconds frequently (before and after eating or handling food, after using toilets, when you blow your nose, cough or sneeze)
- Using alcohol-based hand rub where soap water is not available
- Covering cough or sneeze using your elbow
- Avoiding people who are sick or suspected Covid-19 cases
- Drinking plenty of fluid and maintain hydration
- Eating healthy food
- Having adequate rest
- Postponing any social events planned for new coming baby such as baby shower
- Avoiding non-essential use of public transport
- Avoiding touching your eyes, nose, and mouth with unwashed hands

Sources: CDC 2020, Morris et al., 2020, Tamang et al., 2020

Protecting pregnant women from getting COVID-19

The general advice given to the public is also applicable to pregnant women.¹⁰ The ISIDOG guidelines suggest women to take extensive preventative measures including maintaining social distancing, disinfecting surfaces with >60% ethanol and practicing hand hygiene.⁶ Table 1 lists key preventative measures against the spread of COVID-19.

Changes to antenatal care and routine appointments

Routine obstetric follow up of pregnant women during a pandemic is limited to strict minimum in order to minimise exposure risk for both patients and health care providers (social and physical distancing).⁶ For example, in the United Kingdom (UK) there are fewer face-to-face appointments with their midwife or other health workers and more contact by telephone or online. Although routine tests and scans are proceeding as planned, those pregnant women who have signs of COVID-19 or who are self-isolating are advised not to attend their antenatal appointment. Instead they should inform their midwife and follow COVID-19 guidance about when to seek medical assistance. Some routine appointments can be delayed for a few weeks and this needs to be discussed with your midwife.¹¹

All pregnant patients contacting health providers with COVID-19 symptoms should be directed by telephone to a specific COVID-19 triage unit (as per regional protocol) for further evaluation and testing for COVID-19. Depending on clinical presentation, patients will be either admitted to hospital with isolation measures or transferred to home isolation, results pending.⁶

Current guidance on mode of delivery

Research on pregnant women with COVID-19 has focused mainly on those in their third trimester and requiring hospital stay with medical treatment. In this study, the babies were commonly delivered before the due date and although vaginal birth was possible, more than 91% of women had a caesarean

section. The reason for this, although unclear, was possible foetal distress due to lack of oxygen to the unborn baby.⁵ If the maternal condition is stable and proper foetal monitoring can be assured, vaginal delivery is preferred.⁵ There have also been calls for increasing the number of home births to avoid pregnant women coming into hospital. The safety of homebirth for healthy women having their second or subsequent baby supported by midwives was highlighted in the Birthplace study.¹²

WHO reminds us that the mode of delivery should be based on woman's preferences alongside obstetric indications and that caesarean sections should only be chosen when medically justified.¹³ However, COVID-19 has been detected in faecal samples of some people, therefore, in order to reduce transmission to the baby, birth in water is not recommended for pregnant women who have tested positive for COVID-19.¹⁴ The timing of delivery needs to be determined by a multi-disciplinary team on a case-by-case basis based on maternal and foetal clinical presentation.⁶ The UK advice is to consider the availability of ambulance services to allow for rapid transfer to hospital if a woman with COVID-19 opts for home birth or in a midwife-led unit that is not co-located with an obstetric unit. Right kind of staff should also be present to keep mother and baby safe.¹⁵ All women need to be encouraged to call the health facility (where possible) for advice in early labour and to inform the maternity care provider of any respiratory or other COVID-19 related symptoms, which can then assist in planning further care or potential referral.¹⁶

Care during pregnancy and childbirth

One key message everywhere should be that all pregnant women have the right to high quality maternity care, regardless of their COVID-19 status (confirmed or suspected infections).¹³ During pregnancy and childbirth, women have the right to be treated with respect, dignity, confidentiality, information and informed consent; the right to the highest attainable standard of health, and freedom from discrimination and ill-treatment.¹⁷

Postnatal transmission from parents or other

caretakers to the baby is possible. Therefore, it is important to maintain hand hygiene and physical distancing as far as possible.⁶ Engaging fathers and families in maternal and newborn health care saves lives. The International Confederation of Midwives (ICM) states that a single, asymptomatic birth partner should be permitted to stay with the women during delivery.¹⁴ People around the world have launched campaigns to reverse hospital decisions to exclude birth partners.¹⁸

Every mother and baby have the right to remain together at all times, hence no mother should be separated from her baby without her informed consent.¹⁶ The risk of separating the mother and baby to reduce infection transmission, may considerably outweigh the benefits of keeping mothers and babies together. There is evidence that supports keeping mother and baby together, promotes the health and well-being of both mother and baby. Kangaroo care helps mothers to bond with their baby and support the better physical and developmental outcomes for the baby.¹⁹

COVID-19 and breastfeeding

Transmission of infection from breast milk is unlikely. Advantages of bonding and breastfeeding outweigh the risk of neonatal infection.⁶Hence,

women with COVID-19 can breastfeed if they wish to do so. According to the WHO,²⁰ they should:

- Wash hands frequently with soap and water or use alcohol-based hand rub before and after touching the baby;
- Wear a medical mask during any contact with the baby, including while feeding;
- Sneeze or cough into a tissue and then dispose of it immediately and wash hands again;
- Routinely clean and disinfect surfaces they have touched.

Breastfeeding women should not be separated from their newborns. If the mother is unwell to breastfeed baby due to COVID-19 or other complications, they should be supported to safely provide their baby with breastmilk in a way possible, available, and acceptable to them such as expressing milk; re-lactation; or donor human milk.²⁰ Expressed breastmilk can be labelled and stored for later use if not immediately given to the infant. Table 2 shows recommendations from the Centre for Disease Control (CDC) regarding storage of expressed breast milk: at room temperature for up to 4 hours, refrigerated (not in door shelf) for 4 days and in the freezer for 6-12 months.¹⁴

Table 2 Human Milk Storage Guidelines

Type of Breast Milk	Storage Location and Temperatures		
	Countertop 77°F (25°C) or colder (room temperature)	Refrigerator 40°F (4°C)	Freezer 0°F (-18°C) or colder
Freshly expressed or pumped	Up to 4 Hours	Up to 4 Days	Within 6 months is best Up to 12 months is acceptable
Thawed, previously frozen	1-2 Hours	Up to 1 Day (24 hours)	NEVER refreeze human milk after it has been thawed
Leftover from a feed (baby did not finish the bottle)	Use within 2 hours after the baby is finished feeding		

Source: CDC 2020⁴

All mothers should receive practical support to enable them to initiate and establish breastfeeding and manage common breastfeeding difficulties, including Infection Prevention Control (IPC) measures by appropriately trained health care professionals and community-based lay and peer breastfeeding counsellors.

CONCLUSION

With all the current focus on COVID-19 we must be aware not to ignore other health and public health issues affecting pregnant women and new mothers. For example, pregnant women may present with respiratory symptoms or coughs due to TB or lung cancer, maternity care providers must keep an open mind to differential diagnoses. In terms of Public Health, remember that poor pregnant women will have less money to eat well, fewer ways to reduce their stress levels or keep a social distance from those who are infected with COVID-19. There is also a growing literature that the Public Health measures to reduce the spread of COVID-19 (Table 1) such as social distancing and avoiding the use of public transport, themselves have unintended

consequences. For example, KC and colleagues highlighted that during lock down in Nepal birth in institutions dropped by more than half, whilst stillbirth and neonatal mortality rates rose and quality of care decreased. They argue that society needs to protect access to high quality intrapartum care and prevent excess deaths, especially for the most vulnerable health system users during this pandemic period.²³ More generally there are key issues around health inequality and poverty which poor countries such as Nepal needs to address²⁴, and not just for pregnant women and new mothers but for everyone.

Competing interest

None declared.

REFERENCES

1. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, Ren R, Leung KS, Lau EH, Wong JY, Xing X. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *New England Journal of Medicine*. 2020 March 26;382:1199-1207. DOI: 10.1056/NEJMoa2001316
2. WHO. WHO Director-General's opening remarks at the media briefing on COVID-19: 2020 March 11. Available from: <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020> [Accessed 15 April 2020].
3. Worldometer. COVID-19 Coronavirus death toll. Available from: <https://www.worldometers.info/coronavirus/coronavirus-death-toll/> [Accessed 14 August 2020].
4. Centers for Disease Control and Prevention. Coronavirus disease 2019 (COVID-19). Pregnancy & Breastfeeding. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/pregnancy-breastfeeding.html> [Accessed 25 April 2020].
5. Zaigham M, Andersson O. Coronavirus, pregnant women and infants – new research. Available from: <https://theconversation.com/coronavirus-pregnant-women-and-infants-new-research-136639> [Accessed 26 April 2020].
6. Donders F, Lonnee-Hoffmann R, Tsiakalos A, Mendling W, de Oliveira JM, Judlin P. ISIDOG recommendations concerning COVID-19 and pregnancy. *Diagnostics*. 2020;10(4):243. Available from: <https://www.mdpi.com/2075-4418/10/4/243> [Accessed 26 April 2020].
7. Zeng L, Xia S, Yuan W, Yan K, Xiao F, Shao J, Zhou W. Neonatal early-onset infection with SARS-CoV-2 in 33 neonates born to mothers with COVID-19 in Wuhan, China. *JAMA Paediatrics*. 2020;174(7):722-725. DOI:10.1001/jamapediatrics.2020.0878 2020; Mar 26. Available at: <https://jamanetwork.com/journals/jamapediatrics/article-abstract/2763787> [Accessed 26 April 2020].
8. Schwartz D. An analysis of 38 pregnant women with COVID-19, their newborn infants, and maternal-fetal transmission of SARS-CoV-2: maternal coronavirus infections and pregnancy outcomes. *Archives of pathology & laboratory medicine*. 2020 Jul;144(7):799-805. (Online first) Available from: <https://www.archivesofpathology.org/doi/abs/10.5858/arpa.2020-0901-SA> [Accessed 26 April 2020].
9. Chen H, Guo J, Wang C, Luo F, Yu X, Zhang W, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in

- nine pregnant women: a retrospective review of medical records. *The Lancet*. 2020;395(10226):809-15.
10. Tamang P, Mahato P, van Teijlingen E, Simkhada P. Pregnancy and COVID-19: lessons so far. *Healthy Newborn Network*. Available from: <https://www.healthynewbornnetwork.org/blog/pregnancy-and-covid-19-lessons-so-far/> [Accessed 27 April 2020].
 11. Cheyne H. Pregnant during the coronavirus crisis? Don't panic. *The Conversation* 2020. Available from: <https://theconversation.com/pregnant-during-the-coronavirus-crisis-dont-panic-135108> [Accessed 09 April 2020].
 12. Birthplace in England Collaborative Group. Perinatal and maternal outcomes by planned place of birth for healthy women with low-risk pregnancies: the birthplace in England national prospective cohort study. *BMJ*. 2011; 43. DOI: 10.1136/bmj.d7400.
 13. WHO. Q&A on COVID-19, pregnancy, childbirth and breastfeeding; 2020 March 18. Available from: <https://www.who.int/news-room/q-a-detail/q-a-on-covid-19-pregnancy-childbirth-and-breastfeeding> [Accessed 14 April 2020].
 14. International Confederation of Midwives. 2020. Women's rights in childbirth must be upheld during the coronavirus pandemic. Available from: https://www.internationalmidwives.org/assets/files/news-files/2020/03/icm-statement_upholding-womens-rights-during-covid19-5e814c0c73b6c.pdf [Accesses 27 April 2020].
 15. Morris E, O'Brien P, Goodyear G, Relph S, Jardine J, Powell A, Gilgunn-Jones E, Mullins E, Viner R, Evans D, Ross-Davie M. Coronavirus (COVID-19) infection and pregnancy. Information for healthcare professionals Version 7: Published Thursday 9 April 2020 RCOG & RCM. Available from: <https://www.rcog.org.uk/globalassets/documents/guidelines/2020-04-09-coronavirus-covid-19-infection-in-pregnancy.pdf> [Accessed 09 April 2020].
 16. UNFPA (2020). COVID-19 technical brief for maternity services. Available from: <https://www.unfpa.org/resources/covid-19-technical-brief-maternity-services> [Accessed 27 April 2020].
 17. The White Ribbon Alliance (2020). Respectful maternity care charter. Available from: <https://www.whiteribbonalliance.org/respectful-maternity-care-charter/> [Accessed 27 April 2020].
 18. Family Included. Why women should be allowed a birth partner during coronavirus; 2020. Available from: <https://familyincluded.com/birth-partner-coronavirus/> [Accessed 27 April 2020].
 19. UNICEF (2020). Skin-to-skin contact. Available from: <https://www.unicef.org.uk/babyfriendly/baby-friendly-resources/implementing-standards-resources/skin-to-skin-contact/> [Accessed 27 April 2020].
 20. WHO. Can women with COVID-19 breastfeed? 2020. Available from: <https://www.who.int/news-room/q-a-detail/q-a-on-covid-19-and-breastfeeding> [Accessed 27 April 2020].
 21. WHO. Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected. Available from: [https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-\(ncov\)-infection-is-suspected](https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected) [Accessed 27 April 2020].
 22. KC A, Gurung R, Kinney MV, Sunny AK, Moinuddin M, Basnet O, Paudel P, Bhattarai P, Subedi K, Shrestha MP, Lawn JE, Mälqvist M. Effect of the COVID-19 pandemic response on intrapartum care, stillbirth, and neonatal mortality outcomes in Nepal: a prospective observational study. *Lancet Glob Health*; 2020 August 10. Available from: [https://doi.org/10.1016/S2214-109X\(20\)30345-4](https://doi.org/10.1016/S2214-109X(20)30345-4) [Accessed 14 August 2020].
 23. Asim M, Sathian B, van Teijlingen ER., Mekkodathil A, Subramanya SH, Simkhada P. COVID-19 Pandemic: Public Health Implications in Nepal, *Nepal J Epidemiol*. 2020;10(1): 817-820. Available from: <https://www.nepjol.info/index.php/NJE/article/view/28269> [Accessed: 09 April 2020].