Infant & Young Child Feeding n Nutrition in Perspective
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Breastfeeding During the COVID-19 Pandemic

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Introduction

SARS-CoV-2 is a single-stranded RNA-encapsulated virus causing Coronavirus disease 2019 (COVID-19). The clinical presentation of the infected individuals can range from asymptomatic to severe with systemic involvement. Vaccinations have been shown to slow down the rate of transmission and reduce the risk of morbidity and mortality.

Recommendations on Breastfeeding for Mothers with COVID-19 Infection

A systematic review of 33 studies on COVID-19 and its possible impact on breastfeeding[1] concluded that antibodies against SARS-CoV-2 were present in the breastmilk of infected mothers, thus protecting the infants. While SARS-CoV-2 RNA has been found in breastmilk in some studies, no viable viruses have been recovered.

The World Health Organization (WHO), UNICEF, and other health authorities such as the United States Centers for Disease Control and Prevention (CDC) and the Royal College of Obstetricians and Gynaecologists (RCOG) of the United Kingdom recommend that mothers continue to breastfeed their infants if suspected or known to have COVID-19.[2] Appropriate infection control measures should be in place to minimise risks of contact and droplet transmission, including wearing a mask, washing hands and disinfecting surfaces regularly. In case the mother and neonate are separated due to the mother being isolated, the neonate should be fed with expressed breastmilk.

Recommendations on COVID-19 Vaccination During Lactation

The WHO acknowledged there was a lack of safety data on the use of COVID-19 vaccines in lactating women and their effects on breastfed infants. However, both mRNA and inactivated whole virus vaccines are unlikely to pose a risk to the breastfeeding child.[2] Taking into consideration of the vital importance

of breastfeeding to the health of infants and their mothers, the WHO recommends vaccination in lactating women as in other adults.

Currently, there are two vaccines available in Hong Kong for lactating women, BioNTech (mRNA vaccine) and CoronaVac (inactivated whole virus vaccine). While the efficacy and safety data of CoronaVac is accumulating, mRNA vaccines have been widely used worldwide with more information on their safety profile among lactating individuals. Therefore, BioNTech (mRNA vaccine) is considered the preferred choice of vaccine for lactating women by the Hong Kong College of Obstetricians and Gynecologists (HKCOG).[3]

Immunogenic Benefits of Breastfeeding

Breastfeeding confers protection to infants against infections, in particular, gastroenteritis and respiratory infections.[4,5] This is especially important for infants in the first year of life.

During the third trimester of pregnancy, maternal antibodies are transferred to the foetus through the placenta. After birth, the passive immunity continues as the infant acquires antibodies through breastmilk, including secretory immunoglobulin A (sIgA), secretory immunoglobulin M (sIgM), and immunoglobulin G (IgG). Besides, breastmilk also contains bioactive factors which promote the infant's immunocompetence, for example, oligosaccharides, maternal glycoproteins, cytokines, nucleic acids, and leukocytes.[6]

SARS-CoV-2 Antibodies in the Breastmilk of Vaccinated Individuals

A systematic review and meta-analysis of 18 cohort studies[7] revealed that most mothers who completed the primary course of 2 vaccine doses produced breastmilk that contained both sIgA and IgG against SARS-CoV-2. These studies were conducted worldwide including Europe, the Americas, and Asia, although most were in the United States of America. The vaccines used in the studies were mRNA vaccines except for one study where an inactivated whole virus vaccine was used.

Results of the meta-analysis showed that after the first vaccine dose, 64% (95% CI 51–78%) of the breastmilk samples were positive for SARS-CoV-2 IgA and 30% (95% CI 13.1–46%) were positive for IgG. The collection times of breastmilk ranged from 9.5 days to 4 weeks after the vaccination. After the second vaccine dose (collection times ranged from 3 days to 10 weeks after the dose), the proportion of breastmilk samples positive for IgA in breastmilk was 70% (95% CI 55–86%) and for IgG was 91% (95% CI 80–103%).

SARS-CoV-2 antibodies have different immune functions against the virus, such as removal of infected host cells, enhancing the host's antiviral responses, and virus neutralisation. In the latter case, neutralising antibodies bind to the free SARS-CoV-2 viruses, preventing them from infecting the host cells. A small-scaled locally conducted prospective study[8] revealed an increase in SARS-CoV-2-specific antibody levels in breastmilk and their neutralising capacity in lactating mothers after their first dose of COVID-19 vaccine. The neutralising activity declined with time and a second dose was effective in re-triggering the secretion of neutralising IgA in the breastmilk after its level became undetectable by about 150 days.

The Department of Health in Hong Kong and RCOG recommend that lactating women receive a booster dose of COVID-19 vaccine 3 months after the second dose of their initial COVID-19 vaccine series, based on the evidence that neutralising antibodies against SARS-CoV-2 wane over time after the primary two-dose series.[9]

Immunising the lactating mother with the COVID-19 vaccine, therefore, does not only reduce her risks of getting the infection and suffering from a severe illness (resulting in hospitalisation and death) due to the infection but also confers protection to her young child who is not yet eligible for receiving the vaccine. This is especially important during infancy when the child's immune system is vulnerable.

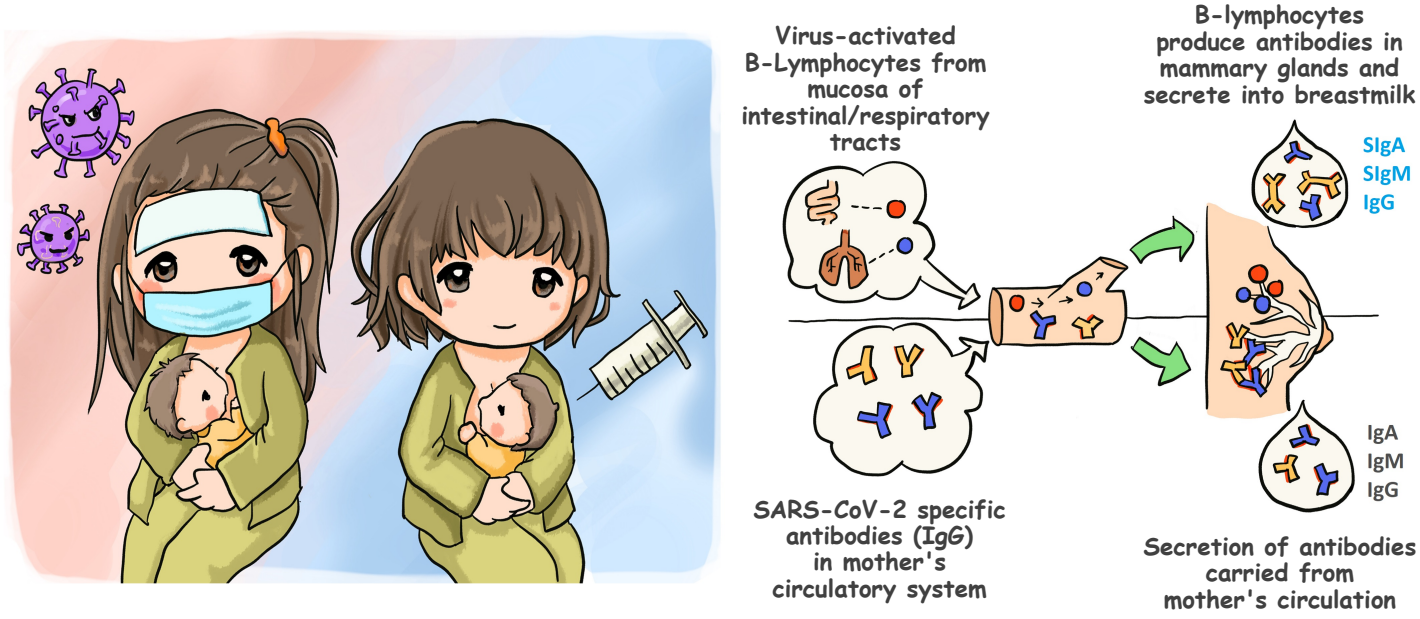

Diagram: The Origins of Antibodies in Breastmilk
(Adapted from Figure 1. The secretion of Igs in human milk[10].)

Conclusion

High rates of positivity of neutralising antibodies in breastmilk follow maternal vaccination against SARS-CoV-2. This signifies the importance of lactating mothers getting vaccinated against SARS-CoV-2, thus conferring protection to their breastfed infants and young children. It is considered beneficial for lactating mothers to complete the primary series of 2 doses of the COVID-19 vaccine and receive a booster dose 3 months afterwards to sustain the neutralising antibody levels in breastmilk.

Key Messages:

- Vaccination is an effective way for lactating mothers to reduce morbidity and mortality from SARS-CoV-2 infections and to protect their breastfed infants and young children.
  接種疫苗是哺乳期母親降低 SARS-CoV-2 感染的發病率和死亡率，並保護母乳餵哺的嬰幼兒的有效方法。

- Neutralising antibodies were found in a high proportion of breastmilk from vaccinated mothers, especially for those who received two doses of mRNA vaccines.
  在接種過疫苗的母親的大部分母乳中發現了中和抗體，尤其是那些接種過兩劑 mRNA 疫苗的母親 。

- Breastfeeding protects infants from severe illness by passive immunity, where SARS-CoV-2 specific antibodies and other bioactive substances are passed to the infants through breastmilk.
  母乳餵哺通過「被動免疫」保護嬰兒免受嚴重疾病的侵害，其中針對 SARS-CoV-2 的抗體以及其他生物活性物質通過母乳傳遞給嬰兒。

- It is recommended that lactating mothers receive a booster dose of the COVID-19 vaccine after completing the primary series in order to sustain the protection of their very young children who are not vaccinated.
  建議哺乳期婦女在完成 COVID-19 疫苗的基本接種（即兩劑）後，接種加強劑量，以維持對未接種疫苗的幼兒的保護。

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