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Breastfeeding during the novel coronavirus (COVID-19) pandemic: guidelines and challenges

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ABSTRACT

COVID-19 pandemic has raised questions on pregnant women and newborns' management. Guidelines, issued by most international agencies and national bodies, recommend rooming-in and direct breastfeeding. In the early days of this pandemic, breastfeeding practices have been challenged by fear among both parents and healthcare workers occasionally resulting in mother-newborn separation. We herein review current breastfeeding guidelines and discuss remaining questions and challenges. As we are facing the second wave of this pandemic, more information is gathered, especially regarding possible virus transmissibility through breastfeeding, enabling more definite instructions about breastfeeding practices.

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Introduction

The novel coronavirus disease (COVID-19) caused by SARS-CoV-2 is an urgent and rapidly spreading global public health threat. In December 2019, the first case of pneumonia caused by SARS-CoV-2 was reported in Wuhan, Hubei Province, China. Since then, the disease has spread worldwide, causing a pandemic [1]. There are major concerns about vulnerable populations include elderly, those with comorbidities, immunocompromised people, as well as pregnant women and their offsprings [2]. To date, there have been few published reports of COVID-19 in pregnant women and neonates born to mothers with confirmed COVID-19 [2]. Although SARS-CoV-2 RNA has been detected in placentas of COVID-19 affected mothers suggesting placental infection, many experts doubt vertical transmission [3–6]. Moreover, there has been evidence of horizontal transmission in newborns born to COVID-19 infected women during the perinatal period with a favorable outcome [7].

There is no clear evidence to date, that SARS-CoV-2 virus is transmitted through breast milk to neonates born to mothers with confirmed COVID-19 during the perinatal period [8]. In addition to the broad scientific consensus on the advantages of breastfeeding, some

scientists argue that there may be an added benefit from the transfer of specific protective antibodies and other elements with antiviral properties to the infant through breast milk [9]. Yet in the case of SARS, although antibodies have been detected in the breast milk of a previously SARS-infected mother from birth to even months after illness, mothers with SARS were advised not to breastfeed [10].

In Greece, although more than six months have elapsed since the beginning of the pandemic, still healthcare workers as well as parents fail to implement recommended breastfeeding practices. As we are currently confronting the second wave of COVID-19 globally, we aimed to review current data on the transmissibility of SARS-CoV-2 through breastfeeding, global guidelines on breastfeeding in women with COVID-19 infection and discuss challenges encountered.

Material and methods

A review of the literature was performed through a PubMed search of original articles, case reports, and reviews, using the key words “coronavirus,” “COVID-19,” “breastfeeding,” “neonates,” and “pregnancy,”

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Due to the urgent and developing nature of the topic, this paper was accepted after an expedited peer review process. For more information about the process, please refer to the Instructions for Authors.

covering a period from 1 December 2019 to 15 July 2020. References of the articles were individually investigated for related articles. Statements and guidance of known organizations were analyzed. Also, reports and guidelines about breastfeeding during COVID-19 from government bodies and agencies of several countries were collected. All articles were selected systematically for inclusion and critically evaluated.

Results

Initially most studies failed to detect SARS-CoV-2 RNA in breast milk [8]. In the literature, only in very few cases, SARS-CoV-2 has been detected in human breast milk [11]. In the first case, the milk sample was positive from day 10 to day 14 postpartum [12]. In the second and third cases, the virus was detected in the breast milk on the 1st and 2nd day after delivery, respectively, while subsequent milk samples were negative for the virus [13,14]. In the fourth case, SARS-CoV-2 was detected in repeated samples of an 8-month-old infant's maternal milk [15].

All current guidelines issued by agencies and governmental bodies are described in detail in Table 1.

Discussion

All international agencies and most governmental bodies agree that feeding with mothers' own milk should be promoted in all babies including those born to COVID-19 infected mothers [16–39]. More specifically, international agencies explicitly support rooming-in and direct breastfeeding in asymptomatic and pauci-symptomatic mothers using respiratory and hand hygiene measures to prevent horizontal transmission to the offspring through respiratory droplets (Table 1). Many authorities propose that the neonate should remain in a distance of 2 m from the mother separated by a barrier such as a transparent curtain and/or be placed in an isolette and receiving hands on care by an unaffected person. On the other hand, WHO argues for Kangaroo and skin-to-skin care. CDC has altered its position statement using shared decision-making between mother and family in consultation with the healthcare providers about the risks and benefits of cohabitating. Many institutions have adopted this position [40–42]. The advantages of breastfeeding on promoting emotional and mental health are well-known. Therefore, postpartum separation policies interfere with the establishment of breastfeeding and bonding, causing stress to both

mother and child. Restrictions on families cause emotional disturbance and may alter the relationship with the baby, having a long-lasting effect. So, it would be desirable to incorporate parents into decision making to reduce their discomfort, promoting family-centered care, even in the absence of physical presence. Many support that an informed consent should be provided by the mother, when she elects rooming-in and direct breastfeeding [19]. It would be interesting to investigate what percentage of COVID-19 positive mothers will, in fact, choose rooming-in over temporary separation and breastmilk pumping. During coronavirus pandemic outbreak, pregnant women infected with SARS-CoV-2 experience fear, anxiety and uncertainty, regarding the care of their newborn and they are often unable to make decisions especially given the lack of vast experience and scientific evidence on this issue. In one study, half of the COVID-19 positive women (50%) reported that they had not been informed on whether breastfeeding is safe during the outbreak [43]. Therefore, in this era of uncertainty and fear, it becomes evident that healthcare workers face challenges impeding the implementation of rooming-in and direct breastfeeding. As the second wave is evolving and it has become evident that this pandemic will last for at least few more months, discussions on breastfeeding practices and precaution measures should be included in prenatal care.

Separation is proposed, only when the mother is unable to care for her baby due to a COVID-19 associated medical condition. In such cases, expression of breast milk through a dedicated breast pump, using breast and pump hygiene, as well as droplets precautions is proposed. When cessation of breastfeeding has occurred, wet nursing or relactation, once the mother recovers, are advised (Table 1). Donor milk is also considered as a safe alternative, although shortages can occur [44].

Importantly, safety issues related to postnatal transmission of COVID-19 through breastfeeding practices need to be discussed. Although in very few cases SARS-CoV-2 RNA has been detected in breastmilk, RT-PCR has not been validated for viral detection in breastmilk, while the detection of RNA does not necessarily imply transmissibility [45]. Moreover, in these cases although mothers reportedly were using respiratory and hand hygiene, the contamination of breast milk samples by respiratory secretions cannot be ruled out. On the other hand, protective antibodies against SARS-CoV-2 have been detected in human breastmilk, supporting its beneficial use [46]. Breastmilk is rich in a variety of antimicrobial and

Table 1. Interim guidelines from international agencies and different countries (in alphabetical order).

Agency/Country	Rooming-in	Direct BF	Guidelines
United Nations Children's Fund (UNICEF) [16]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If mother is severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
World Health Organization (WHO) [17]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If mother is severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene. If mother is critically ill, relactation, wet nursing (another woman breastfeeding or caring for your child) or using donor human milk.
UNFPA Asia Pacific Regional Office [18]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If mother is severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
Union of European Neonatal and Perinatal Societies (UENPS) [19]	Conditional*	Conditional*	Continue breastfeeding with respiratory and hand hygiene if mother is asymptomatic or paucisymptomatic/ No separation. If mother is severely ill, symptomatic and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
WHO- Regional office for Europe in cooperation with EAP; EPA; ECPCP & EBCOG [20]	yes	yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If mother is severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene. If mother is critically ill, relactation wet nursing or using donor human milk.
Australia [21]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If mother severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
Belgium [22]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If mother severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
Brazil [23]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If direct breastfeeding is not possible, expression of breast milk through breast pump, using breast and pump hygiene.
Canada [24]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene /No separation.
China [25]	No	No	No breastfeeding or breast milk feeding/ full separation.
France [26]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If direct breastfeeding is not possible, expression of breast milk through breast pump, using breast and pump hygiene.
Germany [27]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If mother is severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
Greece [28]	Conditional [#]	Conditional [#]	Continue breastfeeding with respiratory and hand hygiene if mother is asymptomatic or paucisymptomatic/ No separation. If mother is severely ill, symptomatic and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
India [29]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene according to mother's wishes/ No separation. If mother is severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
Iran [30]	No	No	If mother is mildly ill, expression of breast milk through breast pump, using breast and pump hygiene. If mother is severely ill, use donor human milk. Full separation.
Ireland [31]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If direct breastfeeding is not possible, expression of breast milk through breast pump, using breast and pump hygiene.
Italy [19]	Conditional [#]	Conditional [#]	Continue breastfeeding with respiratory and hand hygiene if mother is asymptomatic or paucisymptomatic/ No separation. If mother is severely ill, symptomatic and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
Kenya [32]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If direct breastfeeding is not possible, expression of breast milk through breast pump, using breast and pump hygiene. In hospitalized premature neonates, use donor human milk.
Malaysia [33]	No	No	No breastfeeding or breast milk feeding/ full separation.
Philippines [34]	Conditional [#]	Conditional [#]	Continue breastfeeding with respiratory and hand hygiene if mother is asymptomatic or paucisymptomatic/ No separation. If mother is severely ill, symptomatic and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
South Africa [35]	Conditional [#]	Conditional [#]	Continue breastfeeding with respiratory and hand hygiene if mother is asymptomatic or paucisymptomatic/ No separation. If mother is severely ill, symptomatic and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
Spain [36]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If direct breastfeeding is not possible, expression of breast milk through breast pump, using breast and pump hygiene. In hospitalized premature neonates, use donor human milk.
Sweden [37]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If mother is severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
UK [38]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene/ No separation. If mother is severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.
USA – AAP [8]	Conditional [#]	Conditional [#]	Continue breast milk feeding with expression of breast milk through breast pump, using breast and pump hygiene. Separation if possible. If the mother wishes to breastfeed directly her infant, then breastfeeding with respiratory and hand hygiene.
USA – CDC [39]	Yes	Yes	Continue breastfeeding with respiratory and hand hygiene according to mother's wishes/ No separation. If mother is severely ill and temporarily separated, expression of breast milk through breast pump, using breast and pump hygiene.

EAP: European Academy of Pediatrics; EPA: European Pediatric Association; ECPCP: European Confederation of Primary Care Pediatricians; EBCOG: European Board and College of Obstetrics and Gynecology; UNFPA - United Nations Population Fund; WBTI: Word breastfeeding trends initiative; BF: exclusive breast feeding at 6 months of age.

*Neonatal Mortality per 1000 live births

[#]Conditional = Yes, in asymptomatic or paucisymptomatic mothers/No, in symptomatic mothers. Most recommend discussion of risks and benefits and decision case by case.

antiviral factors, as well as growth factors, hormones and beneficial flora, boosting not only the immature immune system of the neonate, but providing a solid base for future health [47,48].

However, horizontal transmission of the virus from the mother to her newborn through respiratory droplets during breastfeeding remains the main concern, rather than the breast milk itself. To date, only some case reports of direct breastfeeding with safety precautions measures by SARS-CoV-2 positive mothers are available: one reported an asymptomatic infant with RT-PCR (+) swab [49], while other showed no proof of horizontal transmission [50–52]. Conversely, data supporting the benefits of isolation of the neonates born to mothers with COVID-19 during the first days of life are limited and whether separation minimizes the risk of transmission remains unproven, especially in the phase of increased transmission in the community.

Although guidelines issued by countries with different level of wealth, neonatal mortality, level of crisis preparedness, and reported breastfeeding patterns were reviewed, no major differences between guidelines were identified (Table 1). Most countries, irrespective to geographic region, development or economic status, comply with WHO guidelines. Confronting the second wave of COVID-19, one may examine whether the extensively approved guidelines are implemented. China seemed to have stricter measures with regard to mother-newborn separation, but these guidelines were issued earlier in the epidemic when uncertainty was greater. In Asia, other countries, like Iran and Malaysia, follow these guidelines. Actual practice must take into account country's resources, cultural associated breastfeeding habits, local extent of the COVID-19 outbreak, as well as healthcare system capacity, among other factors. For example, in countries with a high pandemic preparedness, alternative strategies can be proposed, such as providing scales and home phototherapy to families, parental teaching *via* telehealth and in-person education at the doors of the hospital, and telehealth newborn follow-up [53]. Separation of the neonate will double the burden of both human and material resources in a period with exhaustion of the health care staff and global shortage of personal protective equipment. Mother-child separation becomes even more problematic, as maternal COVID-19 negative testing remains a requirement for hospital discharge in most institutions. According to the literature, SARS-CoV-2 viral shedding can persist up to the second week of symptoms or more [54]. Alternatively, discharge of mother and newborn to home quarantine could be discussed when feasible.

In our experience so far, additional challenges impeding the implementation of rooming-in have been encountered. In Greece, a consensus on management of neonates born to COVID-19 positive mothers, favoring breastfeeding or expression of breast milk with pump under precautions, was recently published [28]. Working in a referral center for COVID-19 building infrastructure constraints have to be taken into account. Women are hospitalized post-partum in COVID-19 designated wards with up to four COVID-19 infected adults in the same room. Under these circumstances, no rooming-in of an unaffected neonate can be provided. The overwhelming demands prevent HCWs to actively support mothers as before the pandemic. Furthermore, nursing staff shortages may also cause significant limitations in adopting a more demanding “modus operanti,” especially in countries like Greece with a longstanding economic crisis, which has decreased the number of available personnel. Nevertheless, encouraging pumping with strict hygiene measures and promoting bonding with frequent visual contact of mother and child resulted in lactation preservation and exclusive breastfeeding after recovery, when desired. As we enter the new phase of the pandemic, a dedicated ward in the Obstetrics Department was set that meets the requirements of appropriate distancing, physical barrier, donning and doffing personal protective equipment area and will enable us to hospitalize neonates together with their asymptomatic/paucisymptomatic mother.

Conclusion

Separation between newborn and mother may have adverse effect on the maternal-child relationship and may disrupt breastfeeding, the importance of which is undisputed. Recent guidelines almost universally support rooming-in and direct breastfeeding of newborns born to COVID-19 women. As we acquire more knowledge of COVID-19, more data will be gathered about the transmissibility of SARS-CoV-2 through breastfeeding. If indeed the safety of direct breastfeeding is shown, it is hoped that scientists will be able to argue assertively against the isolation of neonates born to SARS-CoV-2 positive mothers and to strongly promote the benefits of rooming-in, nursing and breastfeeding using necessary respiratory precautions. Further education and multidisciplinary discussions with all HCWs involved in the care of women and offspring are needed, in order to reinforce best practices after proper counseling for necessary hygiene measures.

Disclosure statement

Pinelopi Triantafyllidou and Anna Daskalaki are International Board Certified Lactation Consultants (IBCLC). The rest of authors have no conflict of interest to disclose.

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