Neonatal Nursing Challenges in Covid-19 Pandemic

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Abstract

The current Covid-19 is the biggest challenge world is facing in the last 100 years. Most of the countries of even developed continents like Europe and North America are facing extreme difficulty to control the disease. Pre-term newborns are a special population with an immature immune system, placing them at greater risk of severe infections including Covid-19. In addition, most of extremely low birth weight infants develop a severe respiratory distress syndrome at birth and can develop broncho-pulmonary dysplasia. Cases of pneumonia have been described in neonates born to mothers with Covid-19. Although most of the neonatal units are not the epicentre for the disease there is an urgent need to have a contingency plan and preparedness for forthcoming challenges in Neonatal intensive care units (NICU). NICUs need to change their strategies towards family-centred care in place of personalised care for neonates because of the different impacts of the disease on the whole family. A rapid review methodology was applied to review research papers. Two major bibliographic databases Pub med and Google scholar were utilised. Results suggests that literature related to vertical transmission from mother to new born, neonatal resuscitation, breastfeeding, routine care, communication, vaccination, and discharge planning, and care of neonatal dead body are considered good. Special addition of management of moral distress of nurses was done as authors believe that nurses are vital for newborn care and until they are not satisfied. This paper highlights the changes that have occurred in neonatal units and their impact on neonatal care and families.

The Covid-19 pandemic is a major threat to mankind. Although, neonates are neither the most affected group in the Covid-19 pandemic nor the epicentre of the disease yet most of the neonatal units are preparing themselves for the pandemic; however the preparation in the developing countries is questionable. It has impacted maternal and newborn care worldwide. An extensive knowledge gap exists in the management of Covid positive suspect and negative mother and newborn (Semaan et al, 2020). Although incidences of Covid 19 are less in newborn as compared to adults but safeguards for the newborn, family members, and health care professional at NICU must be revised (Verma et al, 2020).

Earlier there was a lot of concern about the transmission of Covid-19 from mother to neonates and many neonates even required ventilator support for Covid-19 transmitted from mother to neonates (Alzamora et al, 2020). Pregnant women should be considered a vulnerable population in which exposure is to be avoided. Later it was observed that there is little or no evidence of the vertical transmission in most parts of the world in various studies (Chen et al, 2020; Dong et al, 2020; Zeng et al, 2020; Schwartz et al, 2020). There are very few, if any, pieces of evidence for the teratogenic effects of the virus on the neonatal developing organ system. Fortunately, most of the neonates have little or mild effects on the neonates with mild symptoms (Dong et al, 2020; Lu et al, 2020; Montes et al, 2020).

Pre-term newborns are a special population with an immature immune system, placing them at greater risk of severe infections. In addition, most of extremely low birth weight (LBW) infants develop a severe respiratory distress syndrome at birth and can develop broncho-pulmonary dysplasia. Cases of pneumonia have been described in neonates born to mothers with Covid-19. Pre-term babies born from mothers testing positive for Covid-19 are kept isolated in a dedicated area of the NICU where parents are not allowed, physician and nurses have to wear personal protective equipment according to CDC guidelines. All newborns are kept isolated in thermostat-controlled cribs, and preventive measures are in place for both healthcare providers and parents. Physicians and nurses wear surgical masks, wash their hands frequently, and use hand sanitisers containing at least 60 percent alcohol before and after any contact with the newborn. Parents' visits are restricted to 2 hours a day, and only one parent for each baby, at scheduled times. All

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parents must wear masks, gloves, and disposable clothing. Social distancing practices are adopted. Any close contact between NICU staff and parents or colleagues are avoided. Meetings, clinical updates, journal clubs, and lessons are kept to a minimum, ensuring a distance of at least 1 m between participants, or replaced with teleconferences. Considering the widespread anxiety among parents of admitted infants, a supportive psychological service has been activated (Maria, 2020).

In this pandemic, factors such as a shortage of medical resources, overwork with long shifts, restrictions on socialisation, and the pain of losing infected colleagues as well as the fear to infect their family members have contributed to increasing stress in nurses. Likewise, they have experienced considerable stress in coping with this pandemic with heroic professionalism. In addition to managing the fear of contagion, they have been urged to take on ever-changing responsibilities, according to technical reports. In this situation it is necessary to mitigate moral distress. Well-designed actions that encourage stress reduction, provide psychological support and help make the day-to-day activities in neonatal units less stressful. Strategies such as identification of the most vulnerable professionals as well as the senior experts, debriefing together about ethics in clinical cases, effective communication within the team, accurate guidelines to be followed, and flexibility in nurse leadership to help nurses carry out their work effectively should help to deal with such difficulties and provide moral comfort (Montes et al, 2020).

Objectives

Neonatal nursing challenges due to present pandemic situation such as difficult to finding spaces to prevent mother-child separation, limiting parents' entry in NICU, unexpected outcomes, and restriction of parents in participation care of their new born, breastfeeding issues due to fear of contagion, restrictions on skin-to-skin care to avoid transmission of the virus, restrictions on early discharge programmes, stress due to new governmental guidelines to work, limited peer support, and separation from family.

This article aims to describe ways to overcome the challenges of nursing care of neonates during Covid-19 under the following objectives:

- Discuss NICU preparedness in Covid-19 pandemic.
- Elaborate additional key measures for neonatal resuscitation.
- Update on routine care of the newborn in NICU, breastfeeding, communication, vaccination, and discharge.
- Describe silent features of care of the dead body of newborns.
- Justify the management of moral distress of nurses due to covid-19.

Methods

A rapid review methodology was applied to review research papers (Langlois et al, 2017). Need assessment and topic selection and refinement was done with consultation of experienced faculty of neonatology. The authors developed a protocol for rapid review and performed the literature search. Two major bibliographic database Pub med and Google scholar were utilised. Research and review articles full text in the English language were extracted and synthesised. Online published articles on Covid-19 in newborn, NICU preparedness, nursing care of a newborn in Covid-19 were searched. An intense literature search was done on key themes of neonatal resuscitation, breastfeeding routine care and communication, vaccination, and discharge planning. An extensive review was undertaken on the care of the dead body of newborns and their transportation. Special addition of management of moral distress of nurses was done as authors believe that nurses are vital for newborn care and until they are not satisfied and peaceful, we may not attain quality newborn care. Knowledge synthesis and report preparation were done.

There were a total 23 articles with level 1 to 3 evidences as per Sackett (1989) for the medical research are included in review of articles (Fig 1).

Nurses are the key point in the communication and collaboration process with the parents and they are in an ideal position to explore their anxieties, fears, and difficulties in order to achieve empowerment and competence in their infant's care from their autonomous role, nurses face the individualised care of the high-risk neonate and the family as an inseparable dyad. With continuous presence and empathetic communication, nurses progressively establish a collaborative relationship with the parents to enhance parent-infant bonding and promote competency and empowerment in the infant's care (Montes et al, 2020).

NICU Preparedness

It resumes before the delivery of the baby (Semaan, 2020; Trevisanuto et al, 2020). It is important to ascertain the mother's Covid -19 positive, suspect, or negative status. It should be communicated and documented well to the entire team of health care professionals involved in the management of the birthing process. All the high-risk labor should be performed in a negative pressure airborne infection isolation room with air born precaution. The neonatal care team must be aware of the patient's ob-

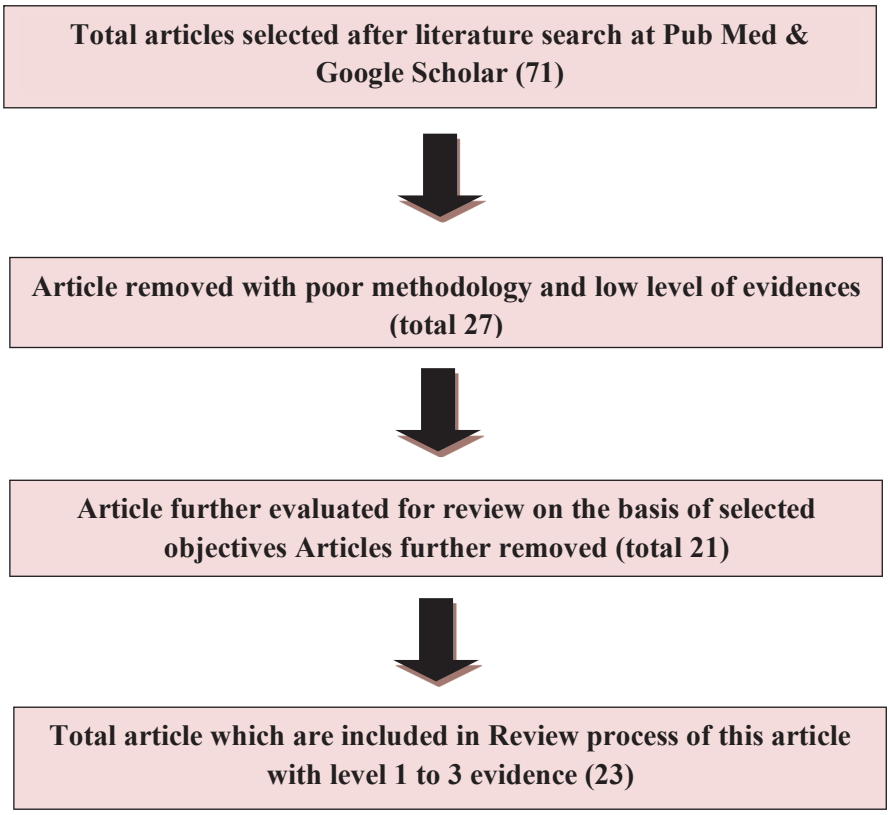


Fig 1: Profile of articles for review (Sackett, 1989).

stetric history. Nasopharyngeal swabs on admission and weekly thereafter. More frequent repetition of the tests in the event of contact with an individual testing positive for Covid-19 or showing symptoms (Maria, 2020). Midwives, obstetricians, anesthetists, neonatologists, and other supporting staff should be alert and well informed about the expected role (Verma et al, 2020). Simulation training and mock drill specific to Covid precautions based on national and institutional guidelines are highly beneficial ineffective management of newborn and prevention of infection (Amatya et al, 2020). The birthing unit must display written SOP (standard operating procedure) and protocol about the indication of PPE and donning, doffing, and that it's disposable (Verma et al, 2020; Semaan, 2020). Throughout the birthing process, the mother should wear a surgical mask it may reduce the droplet spread of infection (Chandrasekharan et al, 2020). Preparedness of the facility should be assessed by a checklist before every delivery (Verma et al, 2020).

Strictly follow the recommendations of protection and isolation. Individualise care and decisions according to the status of the mother and infant.

Neonatal Resuscitation

Who should perform the neonatal resuscitation? It is vital to assign a role in advance. Newborns were tested for Covid-19 in accordance with governmental policies requiring testing of newborns of mothers with confirmed or suspected Covid-19. Infants born to mothers with positive SARS-CoV-2 infection generally have favourable outcomes, with no convincing case of vertical transmission, at least when delivery route was caesarean section. Identify and inform who will attend delivery among the NICU team and who will be kept ready outside the delivery room. A nurse who attends normal delivery and performs neonatal resuscitation of a newborn more than 35 weeks of gestation age should don full PPE, receive the baby immediately after birth, and evaluate gestational age, muscle tone, and respiratory status of newborn. If a baby's condition is stable she should wrap the baby in a pre-warm blanket and the baby should be placed in a pre-warmed transportation isolate. In case the gestation age is less than 35 weeks and high-risk pregnancy the entire neonatal resuscitation team has to attend the neonatal resuscitation. The nurse should check all the equipment and supply and keep ready for use.

Suitable Place for Neonatal Resuscitation

The ideal location of neonatal resuscitation is unclear. It may be performed in a specific room that has negative pressure provision. It may be undertaken in the labour room itself with six feet (or two-meter) distance from the mother with physical barriers like a screen or curtain but the room should have a negative pressure facility (Chandrasekharan, 2020). If performed in an isolation room along with the mother we must maintain six feet distance from the mother. Only a limited number of health care professionals should be allowed inside the room and the rest of the team members may be kept ready outside the room. Updated AAP and NRP guidelines should be followed. Neonatal resuscitation should be performed preferably in an isolette and warmth must be maintained during the process.

Peculiarities of Respiratory Care

Airway management of the newborn should be based on NRP updates. To minimise the risk of spread of infection, practice close ventilator circuits with appropriate size viral or bacterial filter, and sealed mask. These filters must change every 8-12 hours. Prefer a laryngeal mask airway instead of a face mask. Perform continuous oropharyngeal suction than intermittent oropharyngeal suction in non-intubated babies. It would prevent the flux of

aerosol particles (Shalish, 2020). In the case of endotracheal intubation utilise video larynges copy to minimises the distance thus reducing the risk. The endotracheal route of drug administration must be avoided. All kinds of unused disposable items must be discarded (Chawla et al, 2020).

A wet towel used to wipe the baby is contaminated therefore it should be discarded immediately with all precautions. The baby should be bathed after the delivery to eliminate contaminated secretions from the body (Nolan et al, 2020). However, some authors do not recommend bathing just after birth to avoid hypothermia (Chawla et al, 2020). Avoid skin-to-skin contact. Cases of pneumonia have been described in neonates born to mothers with Covid-19. All newborns are kept isolated in thermostat-controlled cribs, and preventive measures are in place for both healthcare providers and parents.

Post-neonatal Resuscitation Cares

A newborn from a Covid positive mother should be kept away from the mother and placed in an isolation room. If mother and baby are kept together, they should be separated at a distance of six feet. The mother should wear masks and follow hand hygiene practices.

Care in NICU

Newborn delivered by a Covid positive mother should be kept separate in a negative pressure room. Neutral pressure room may be assigned to stable neonates with droplet and contact precautions (Trevisanuto et al, 2020).

Use individual or disposable care equipment. Ensure proper disinfection and cleaning of equipment surfaces and the environment as per institutional guidelines. Restrict entry of health team members in the NICU. Nurses should follow standardised procedures for hand cleaning and wearing protective clothing before accessing the NICU. A log of every health care professional (HCP) entering and exiting the patient's room should be kept.

Breastfeeding

Presence of the virus in the breast milk of Covid-19 mothers has not been proven by evidence hence breastfeeding may be allowed using stern hand hygiene and droplet precautions (Nolan et al, 2020; Green et al, 2020; WHO, 2020). Isolation of mother and baby until swab test results are available. Pumping milk without breastfeeding until swab test results are available. Mother or family members may be counselled to decide upon mode of breastfeeding like direct breastfeeding or expressed breast milk feeding. It is recommended that nurses and midwives should reinforce breastfeeding to establish a bond between mother and newborn, it would reduce maternal stress while quarantine and promote early discharge from the hospital (Chawla et al, 2020; Salvatori et al 2020).

Communication between NICU team and caregiver

Prepare a participatory contingency care plan with parents and health team members. Clear signage outside the room regarding infection precautions needed before entering the room. Clear planned communication chain is necessary. Non-verbal communication such as voice modulation and eye contact is significant when nurses wearing gown and mask (Montes et al, 2020).

Should newborn be vaccinated at birth?

The birth dose of BCG, OPV, and Hepatitis B must be administered at the birthing facility. All standard precautions should be followed at the time of vaccination.

Care at the time of discharge

Asymptomatic newborns with no results or no tests for Covid-19 can be discharged home, outpatient follow-up by telephone or telemedicine or face-to-face assessments up to 14 days after discharge from hospital (Carvalho et al, 2020). Nurses should handover the baby to a healthy family member who should be wearing a mask and possibly (s)he has to quarantine at home. Nurses should opt for video conferencing for health education and if it is direct health education all personnel should wear appropriate PPE and maintain a distance of six feet. Educate parents/caregivers about precautions of home isolation based on local government guidelines. Limit visitors at the home. The mother should use a mask and follow hand hygiene while care for the baby at home. Caretaker must be informed of danger signs in the newborn in the pretext of Covid-19 and follow-up protocol (Amatya et al, 2020).

Care of Dead Body of a Newborn

Nurses who care for the dead body of the neonate must follow standard infection precaution control practices prescribed by international and national government agencies. These may include meticulous hand hygiene, PPE (water resistance apron, goggle N95 mask, and gloves). Carefully remove all tubes, drains, and catheters. All puncture holes should be disinfected with freshly prepared 1% hypochlorite solution and seal with impermeable material. Ensure the packing of all the orifices of the neonate's body. Handle and dispose of sharp carefully. The body should be packed in a leak-proof plastic bag. The outer surface of the body bag should be pretreated with 1% hypochlorite solution. Thereafter the body bag may be covered with a sheet. All soiled linen and equipment medical

waste must be handled and disposed of as per the biomedical waste management guidelines. The body should be transferred through a designated route and should be instructed to criminate as soon as possible. All surfaces of the isolation room and all exposed area should be wiped with a 1% hypochlorite solution with time duration of contact time of 30 minutes and let it air dry (GoI guidelines, 2020; Erdeve et al, 2020).

Handling the Moral Distress Related to Duties amidst of Covid-19

Pandemic has imposed considerable stress on nurses. It is due to demands of profession, personnel, and social role. Nurses should acknowledge their moral distress and should handle it with impact full communication. Nurses should follow the standards of protection and isolation and if needed raise the demand for PPE. They should be vocal when confronting with physical and psychological fatigue. Even NICU should arrange regular visits of the psychologist to counsel staff and parents.

Discussion

This article is an endeavour to promote evidence-based nursing care to neonates in NICU during Covid -19 pandemic crisis. The information of this article is based on limited resources. We recommend the integration of reviewed evidence at the local level with the availability of protocol and resources as per national guidelines.

Vertical and perinatal mother-to-newborn transmission of Covid-19 has not yet been confirmed (Zeng et al, 2020; Mingyang et al, 2020). Three women infected with Covid-19 in the peripartum period had three different maternal and neonatal outcomes. In all three cases, the obstetricians, anesthesiologists, neonatologists, and nurses wore full PPE, including an N95 mask, eye goggles, face shield, and a top-to-bottom tight-fitting gown, entering the operating theatres about 5 min before the patients. Notably, only obstetricians touched both the mothers and newborns during the time of Caesarean delivery, handing the newborns off to the neonatologists after delivery. The resuscitation tables for newborns were about 3 m away from the head of the mothers. The operating theatres in Cases 2 and 3 were equipped with negative pressure to minimise virus spread. The first case suggests mother-to-newborn transmission of SARS-CoV-2 during an urgent Caesarean delivery under general anaesthesia. The other two mothers both had urgent Caesarean deliveries under spinal anesthesia; one baby never became infected and the other baby was diagnosed with Covid-19 despite negative SARS-CoV-2 testing. Although the route of transmission in these newborns is not clear, it is important to maintain practices to minimise droplet and contact spread.

All newborns are kept isolated in thermostat-controlled cribs, and preventive measures are in place for both healthcare providers and parents. Physicians and nurses wear surgical masks, wash their hands frequently, and use hand sanitisers containing at least 60% alcohol before and after any contact with the newborn.

Results

Results suggests that literature related to vertical transmission from mother to new born, neonatal resuscitation, breastfeeding, routine care, communication, vaccination, discharge planning, and care of neonatal dead body are considered good. Especial addition of management of moral distress of nurses was done as authors believe that nurses are vital for newborn care.

Conclusion

The synthesis of articles suggests that challenges of neonatal care in the Covid-19 pandemic could be overcome by proactive preparation, planning, and communication. Nurses are the key point in the communication and collaboration process with the parents and they are in an ideal position to explore their anxieties, fears, and difficulties in order to achieve empowerment and competence in their neonate care.

References

1. Semaan A, Audet C, Huysmans E, Afolabi B, Assarag B, Banke-Thomas A, et al. Voices from the frontline: Findings from a thematic analysis of a rapid online global survey of maternal and newborn health professionals facing the COVID-19 pandemic. BMJ Glob Heal 2020; 5(6): e002967
2. Verma S, Lumba R, Lighter JL, Bailey SM, Wachtel EV, Kunjumon B, et al. Neonatal Intensive Care Unit Preparedness for the Novel Coronavirus Disease-2019 Pandemic: A New York City Hospital Perspective. Current Problems in Pediatric and Adolescent Health Care 2020:100795
3. Alzamora MC, Paredes T, Caceres D, Webb CM, Valdez LM, La Rosa M. Severe COVID-19 during pregnancy and possible vertical transmission. Am J Perinatol 2020; 37(8): 861-65
4. Chen D, Yang H, Cao Y, Cheng W, Duan T, Fan C. Expert consensus for managing pregnant women and neonates born to mothers with suspected or confirmed novel coronavirus (COVID-19) infection. Int J Gynaecol Obstet 2020; 149 (2): 130-36
5. Dong L, Tian J, He S, Zhu C, Wang J, Liu C, et al. Possible vertical transmission of SARS-CoV-2 from an infected mother to her newborn. JAMA 2020; 323 (18): 1846-48
6. Zeng L, Xia S, Yuan W. Neonatal early-onset infection with SARS-CoV-2 in 33 neonates born to mothers with COVID-19 in Wuhan, China [published online ahead of print March 26, 2020]. JAMA Pediatr 2020; 174 (7): 722-25
7. Schwartz DA. 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. Arch Pathol Lab Med 2020; 144 (7): 799-805

8. Lu X, Zhang L, Du H, Zhang J, Li YY, Qu J, et al. SARS-CoV- 2 infection in children. New England J Med 2020; 382 (17): 1663-65.

9. Montes MT, Herranz-Rubia N. NeNe Nursing Group. Neonatal nursing in the COVID-19 pandemic: Can we improve the future? J Neonatal Nurs 2020; 26 (5): 247-51

10. Langlois EV, Straus SE, Mijumbi-Deve R, Lewin S, Tricco AC Chapter 1: The need for rapid reviews to inform health policy and systems pp 1-19; 2017. Available at https://apps.who.int/iris/bitstream/handle/10665/258698/9789241512763 eng.pdf?sequence=1

11. Sackett DL. Rules of evidences and clinical recommendation the use of antithrombolytic agents. Chest 1989; 95 (2): 2S-4S

12. Trevisanuto D, Moschino L, Doglioni N, Roehr CC, Gervasi MT, Baraldi E. Neonatal resuscitation where the mother has a suspected or confirmed novel coronavirus (SARS-CoV-2) infection: Suggestion for a pragmatic action plan. Neonatol 2020: 117: 133-40

13. Amatya S, Corr TE, Gandhi CK, Glass KM, Kresch MJ, Mujsce DJ, et al. Management of newborns exposed to mothers with confirmed or suspected COVID-19. J Perinatol 2020: 1-10

14. Chandrasekharan P, Vento M, Trevisanuto D, Partridge E, Underwood MA, Wiedeman J, et al. Neonatal resuscitation and postresuscitation care of infants born to mothers with suspected or confirmed SARS-CoV-2 infection. Am J Perinatol 2020; 37 (8): 813

15. Shalish W, Lakshminrusimha S, Manzoni P, Keszler M, Sant'Anna GM. COVID-19 and neonatal respiratory care: Current evidence and practical approach. Am J Perinatol 2020; 37(8): 780

16. Chawla D, Chirla D, Dalwai S, Deorari AK, Ganatra A, Gandhi A, et al. Perinatal-neonatal management of COVID-19 Infection - Guidelines of the Federation of Obstetric and Gynaecological Societies of India (FOGSI) National Neonatology Forum of India (NNF) and Indian Academy of Pediatrics (IAP). Indian Pediatr 2020; 57(6): 536-48

17. Nolan JP, Monsieurs KG, Bossaert L, Böttiger BW, Greif R, Lott C, et al. European Resuscitation Council COVID-19 guidelines executive summary. Resuscitation 2020; 153: 45-55

18. Green J, Petty J, Bromley P, Walker K, Jones L. COVID-19 in babies: Knowledge for neonatal care. J Neonatal Nurs [Internet]. 2020 July

19. World Health Organization. (2020). COVID-19: Operational guidance for maintaining essential health services during an outbreak: Interim guidance, World Health Organisation, 25 March 2020

20. Salvatori G, De Rose DU, Concato C, Alario D, Olivini N, Dotta A, et al. Managing COVID-19-Positive maternal–infant dyads: An Italian experience. Breastfeeding Med 2020; 15(5): 347-48

21. Carvalho WB, Gibelli MA, Krebs VL, Calil VM, Johnston C. Expert recommendations for the care of newborns of mothers with COVID-19. Clinics 2020; 75

22. Government of India. Guidelines on dead body management Available at https://www.mohfw.gov.in/pdf/1584423700568_COVID 19

23. Erdeve Ö, Çetinkaya M, Baş AY, Narlı N, Duman N, Vural M, et al. The Turkish Neonatal Society proposal for the management of COVID-19 in the neonatal intensive care unit. Turk Pediatri Ars 2020; 55(2): 86–92

24. Maria Elena. Managing a tertiary level NICU in the time of COVID-19: Lessons learned from a high risk zone. 21 April 2020: https://doi.org/10.1002/ppul.24788

25. Mingyang Sun, Guoting Xu, Yong Yang, Vandana Madhvan, Zhongcong Xie, Jiaqiang Zhang. Evidence of mother-to-newborn infection with COVID-19. April 27, 2020 DOI: https:/doi.org/10.1016/bja2020.04.066

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