

Perinatal management of SARS-CoV-2 infection in a level III University Hospital

Susana Pissarra , Marta Rosário , Marina Moucho & Henrique Soares

To cite this article: Susana Pissarra , Marta Rosário , Marina Moucho & Henrique Soares (2020): Perinatal management of SARS-CoV-2 infection in a level III University Hospital, The Journal of Maternal-Fetal & Neonatal Medicine, DOI: [10.1080/14767058.2020.1786526](https://doi.org/10.1080/14767058.2020.1786526)

To link to this article: <https://doi.org/10.1080/14767058.2020.1786526>



Published online: 23 Jul 2020.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)

SHORT REPORT



Perinatal management of SARS-CoV-2 infection in a level III University Hospital

Susana Pissarra^{a,b}, Marta Rosário^{a,b}, Marina Moucho^{b,c} and Henrique Soares^{a,b}

^aNeonatal Intensive Care Unit, Pediatrics Department, Centro Hospitalar Universitário São João, Porto, Portugal; ^bFaculty of Medicine, Oporto University, Porto, Portugal; ^cObstetrics Department, Centro Hospitalar Universitário São João, Porto, Portugal

ABSTRACT

Over the past 4 months, SARS-CoV-2 pandemic has spread all over the world. The lack of understanding of this pandemic epidemiological characteristics, clinical implications and long term consequences have raised concern among healthcare workers. Pregnant women and newborns are a particularly worrisome population since data referring to real infection impact in these patients are scarce and management controversial. We report on the perinatal management of the first consecutive ten mother-infant dyads of SARS-CoV-2 infection complicated pregnancy. All mothers were included in newborn management planning prior to delivery and decided on separation from their newborns; nine decided on postponing breastfeeding until SARS-CoV-2 negativity while maintaining lactation stimulation. No evidence of vertical transmission was found (all NP swab and bronchial secretions SARS-CoV-2 RT-PCR were negative). No newborn developed clinical evidence of infection. In the face of current scientific uncertainty, decisions of perinatal management, such as mother-infant separation and breastfeeding, must involve parents in a process of shared decision making.

ARTICLE HISTORY

Received 2 May 2020
Revised 14 May 2020
Accepted 19 June 2020

KEYWORDS

SARS-CoV-2; neonatal;
COVID-19

Introduction

SARS-CoV-2 infection and disease – COVID-19 – has spread all over the world, with over 2 million persons infected and more than 175,000 deaths declared by 22 April 2020.

In Portugal, the first identified case occurred in the northern region, where our level III University Hospital stands, on March 2nd, and despite the lockdown measures imposed by the government, the infection has spread all over the country.

At our hospital the first SARS-CoV-2 infected pregnant woman delivered at March 16th. Universal screening of all pregnant women admitted to the Maternity Unit was implemented on March 29th.

Material and methods

Pregnant women with COVID-19 confirmed by real-time polymerase chain reaction (RT PCR) SARS-CoV-2 of nasopharyngeal (NP) and oropharyngeal (OP) swabs were included.

A contact was established with the mother as soon as her positive result was available to discuss available scientific evidence regarding vertical/horizontal transmission, breastfeeding and clinical outcome of neonatal COVID-19.

Shared decision was made regarding separation/rooming in, breastfeeding/pump extraction, mother's milk administration by healthy caregiver/rejection.

For those mothers who agreed to stimulate lactation with pump extraction, a video depicting World Health Organization (WHO) guidelines on hand hygiene was sent and thoroughly reviewed. Strict infection control measures for breast milk extraction with a dedicated breast pump (respiratory hygiene and face mask utilization, hand hygiene guidelines, before and after extraction, and after proper pump cleaning) were implemented with the mother and daily reviewed.

For mothers who chose separation, a search for healthy dedicated caregiver, among family members was ensued and identified healthy caregivers and cohabitants were tested for SARS-CoV-2.

CONTACT Susana Pissarra ✉ susanapissarra@gmail.com 📧 Faculty of Medicine, Oporto University, Alameda Professor Hernani Monteiro, Porto 4200-052, Portugal

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.

© 2020 Informa UK Limited, trading as Taylor & Francis Group

Mode of delivery was determined by obstetric reasons and birth occurred in isolation room. Health care professionals (HCP) assisting delivery were equipped with complete personal protective equipment (PPE) including FFP2 mask, goggles, cowl, impermeable gown, shoe covers and double pair of gloves.

Newborns whose mothers chose separation were transferred in a closed incubator to a dedicated negative pressure ward of the NICU, under strict isolation measures until neonatal SARS-CoV-2 infection was discarded (RT PCR SARS-CoV-2 of NP swab and of bronchial secretions after birth and at 48 h after birth negative). Newborn management, apart from the isolation measures, was done according to standard neonatal care.

Daily contact was maintained after mother and newborn discharge, and compliance with given instructions regarding milk extraction and newborn clinical status and management were evaluated.

Results

From 16 March 2020 to 22 April 2020, 10 COVID-19 pregnant women delivered at our hospital (Table 1).

One mother was admitted to the Intensive Care Unit for 48 h and placed under high flow oxygen therapy, with favorable evolution.

All newborns, following the mother's decision, were transferred in a closed incubator to the NICU (Table 2). All newborns remained symptom free and tested negative for SARS CoV2 at birth and at 48 h of life.

Nine mothers stimulated lactation with pump extraction under strict infection control measures and chose to discard extracted milk until RT PCR SARS-CoV-2 negativity.

Newborns were discharged home to the care of family caregivers designated by the mother. At the time of the writing of this report, four mothers breastfeed, five mothers maintain milk extraction protocol and intend to breastfeed once their RT PCR SARS-CoV-2 reveals negative. One mother refused to stimulate lactation.

Discussion

Real COVID-19 impact in pregnant women and newborns is scarce and previous experiences with other coronaviruses infections, are all but tranquilizing [1]. COVID-19 represents an important burden to health

Table 1. Maternal epidemiological and clinical characteristics.

Case	Age (Y)	Parity	GA (W)	Universal screening	SARS-CoV-2 epidemiological link	Time from beginning of symptoms to delivery (days)		Symptoms	Type of delivery (indication)	Time to discharge (days)
						Symptoms	Time to delivery (days)			
1	32	2G1P	38+6	No	Yes	Yes	3	Fever Cough	Vaginal	3
2	35	5G3P1A	40+0	Yes	No	No	0	0	C-section (obstetrical indication)	2
3	40	2G1P	40+4	Yes	No	Yes	15	Ageusia Anosmia	Vaginal	1
4	34	1G0P	34+2	No	Yes	Yes	8	Ageusia Anosmia	Vaginal	1
5	34	3G1P1A	39+5	Yes	No	No	0	0	Vaginal	2
6	38	6G0P5A	37+1	Yes	No	No	0	Ageusia Anosmia	Vaginal	3
7	32	1G0P	37+3	No	Yes	Yes	1	Cough	C-section (obstetrical indication)	3
8	32	1G0P	39+4	No	Yes	Yes	8	Fever Cough	C-section (severity respiratory symptoms)	10
9	27	2G1P	37+5	No	Yes	Yes	1	Dyspnea Cough	C-section (severity respiratory symptoms)	3
10	19	2G1P	37+1	Yes	No	Yes	2	Thoracalgia Dyspnea Fever	Vaginal	3

Table 2. Newborn epidemiological and clinical characteristics.

Case	Gender	GA (w)	Birth weight (g)	RT PCR SARS CoV2 at birth	RT PCR SARS CoV2 at 48 h of life	Discharged home under the care of	Duration of hospital stay (days)
1	F	38 + 6	3240	Negative	Negative	Mother	37
2	M	40 + 0	3110	Negative	Negative	Mother	9
3	M	40 + 4	3350	Negative	Negative	Father	18
4	F	34 + 2	2180	Negative	Negative	Father	21
5	M	39 + 5	2840	Negative	Negative	Grandmother	4
6	M	37 + 1	3020	Negative	Negative	Sister	28
7	F	37 + 3	2820	Negative	Negative	Father	4
8	M	39 + 4	3670	Negative	Negative	Father	16
9	F	37 + 5	3630	Negative	Negative	Aunt	4
10	F	37 + 1	3160	Negative	Negative	Grandmother	6

care facilities that have to adapt their protocols in order to face this huge challenge [2].

Several reports, focusing on maternal infection occurring during the third trimester, seem to point toward lack of vertical transmission of SARS CoV2 [1,3–11]. However, recent reports of elevated SARS-CoV-2 IgM antibodies, in the absence of RT PCR SARS-CoV-2 positivity, in three neonates has again raised suspicion regarding the possibility of *in utero* transmission [12,13]. Reports of positive RT PCR SARS-CoV-2 of neonates NP swab at day 2 of life in three newborns, and at 16 h of age, 24 h of age (with concomitant positivity of amniotic fluid) and 36 h of age, in three others, separated from their mothers immediately after birth, have raised concern that in fact vertical transmission might occur [14–17].

In our study, all newborns tested negative for RT PCR SARS CoV2 at birth and 48 h of life, which may be attributed to early identification of infected women due to universal screening, strict infection control measures during delivery and the fact that all the mothers decided on separation, thus eliminating the possibility of horizontal transmission. The results of future molecular testing of preserved specimens (amniotic fluid, cord blood, placenta) will certainly shed additional light into this subject.

While the benefits of human milk are absolutely consensual, the risk of horizontal transmission during breastfeeding and the lack of robust evidence about the role of breastmilk on SARS-CoV-2 transmission justify different approaches to breastfeeding advocacy.

At our institution, a shared decision-making (between mother and clinical team) approach was pursued. All the mothers chose separation and nine of them decided on expression of breast milk to establish and maintain milk production, which was successfully accomplished in all of them. None of the nine mothers accepted to administer their expressed milk to their newborn until negative testing for SARS-CoV-2, though. Data from small case series and case reports seem to point to the absence of SARS-CoV-2 in breast

milk but robust evidence obtained from larger number of SARS-CoV-2 positive lactating mother's human milk samples testing is urgently needed if we are to safely advise mothers not to discard their extracted milk [8,9,15,16,18–20].

In conclusion, our case series seem to point to absent vertical transmission of SARS-CoV-2 infection. Since all the mother-infant dyads were separated, no case of horizontal transmission occurred. In the face of such scientific uncertainty, decisions of perinatal management, such as mother-infant separation and breastfeeding, must involve the parents in a process of shared decision with HCP. The lack of robust evidence to support clinical decisions should be compensated by a strong support by HCP who must be conscious of the potential stress these shared decisions impart on parents in such a delicate period of their lives. Aware of this, in our institution, these families are also offered support by our NICU dedicated psychology team.

Acknowledgements

The authors acknowledge the contribution of health care workers from the Neonatal Intensive Care Unit and Obstetrics Department of Centro Hospitalar Universitário São João to the clinical management and support of the patients described in this paper.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

- [1] Schwartz DA, Graham AL. Potential maternal and infant outcomes from (Wuhan) coronavirus 2019-nCoV infecting pregnant women: lessons from SARS, MERS, and other human coronavirus infections. *Viruses*. 2020;12(2):194.
- [2] Capanna F, Haydar A, McCarey C, et al. Preparing an obstetric unit in the heart of the epidemic strike of

- COVID-19: quick reorganization tips. *J Matern Fetal Neonatal Med.* 2020;12:1–7.
- [3] Yang Z, Wang M, Zhu Z, et al. Coronavirus disease 2019 (COVID-19) and pregnancy: a systematic review. *J Matern Fetal Neonatal Med.* 2020:1–4. DOI:10.1080/14767058.2020.1759541
- [4] Zaigham M, Andersson O. Maternal and perinatal outcomes with COVID-19: a systematic review of 108 pregnancies. *Acta Obstet Gynecol Scand.* 2020;99(7):823–829.
- [5] Chen L, Li Q, Zheng D, et al. Clinical characteristics of pregnant women with COVID-19 in Wuhan, China. *N Engl J Med.* 2020;382(25):e100.
- [6] Chen Y, Peng H, Wang L, et al. Infants born to mothers with a new coronavirus (COVID-19). *Front Pediatr.* 2020;8:104.
- [7] Ma X, Zhu J, Du L. Neonatal management during coronavirus disease (COVID-19) outbreak: Chinese experiences. *Neoreviews.* 2020;21(5):e293–e297.
- [8] Chen H, Guo J, Wang C, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. *Lancet.* 2020;395(10229):809–815.
- [9] Li Y, Zhao R, Zheng S, et al. Lack of vertical transmission of Severe Acute Respiratory Syndrome Coronavirus 2, China. *Emerg Infect Dis.* 2020;26(6):1335–1336.
- [10] Yang P, Wang X, Liu P, et al. Clinical characteristics and risk assessment of newborns born to mothers with COVID-19. *J Clin Virol.* 2020;127:104356.
- [11] Liu W, Wang J, Li W, et al. Clinical characteristics of 19 neonates born to mothers with COVID-19. *Front Med.* 2020;14(2):193–198.
- [12] Zeng H, Xu C, Fan J, et al. Antibodies in infants born to mothers with COVID-19 pneumonia. *JAMA.* 2020;323(18):1848–1849.
- [13] Dong L, Tian J, He S, et al. Possible vertical transmission of SARS-CoV-2 from an infected mother to her newborn. *JAMA.* 2020;323(18):1846–1848.
- [14] Nie R, Wang S, Yang Q, et al. Clinical features and the maternal and neonatal outcomes of pregnant women with coronavirus disease. 2019. DOI:10.1101/2020.03.22.20041061
- [15] Zeng L, Xia S, Yuan W, et al. Neonatal early-onset infection with SARS-CoV-2 in 33 neonates born to mothers with COVID-19 in Wuhan, China. *JAMA Pediatr.* 2020;174(7):722–725.
- [16] Wang S, Guo L, Chen L, et al. A case report of neonatal COVID-19 infection in China. *Clin Infect Dis.* 2020;ciaa225. DOI:10.1093/cid/ciaa225
- [17] Zamaniyan M, Ebadi A, S, Mir, et al. Preterm delivery in pregnant woman with critical COVID-19 pneumonia and vertical transmission. *Prenat Diagn.* 2020:1–3. DOI:10.1002/pd.5713
- [18] Salvatori G, De Rose DU, Concato C, et al. Managing COVID-19-positive maternal-infant dyads: an Italian experience. *Breastfeed Med.* 2020;15(5):347–348.
- [19] Peng Z, Wang J, Mo Y, et al. Unlikely SARS-CoV-2 vertical transmission from mother to child: a case report. *J Infect Public Health.* 2020;13(5):818–820.
- [20] Wang X, Zhou Z, Zhang J, et al. A case of 2019 Novel Coronavirus in a pregnant woman with preterm delivery. *Clin Infect Dis.* 2020;ciaa200. DOI:10.1093/cid/ciaa200