

# Was Rooming-In a Safe Approach to Newborns from SARS-CoV-2 Positive Mothers?

Joana Jonet<sup>1</sup>, Luzia Condessa<sup>1</sup>, Maria Limbert<sup>1</sup>, Margarida Roquette<sup>1</sup>, Ana Tavares<sup>2</sup>, Manuel Cunha<sup>2</sup>

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## Abstract

**Introduction:** Since the emergence of coronavirus disease 2019, known as COVID-19, there are limited data describing the risks and specific effects of severe acute respiratory syndrome coronavirus 2, or SARS-CoV-2, in pregnant women and their neonates. To date, there is scarce evidence of *in utero* transmission, and the risk of perinatal transmission and consequent neonate risk of developing COVID-19 during the perinatal period are also unknown.

**Methods:** Since April 2020, universal screening of all pregnant women presenting in labor has been implemented in our hospital. To those who are positive for SARS-CoV-2, the possibility to room-in with the neonate is given. Neonates are tested for SARS-CoV-2 within the first 24 hours and again at 48 hours of life. We made a prospective cohort analysis of all neonates born of mothers positive for SARS-CoV-2 in our hospital from April to November 2020. Demographics, neonatal and maternal symptoms at the delivery, during hospitalization and once discharged, perinatal routine care and SARS-CoV-2 reverse transcription polymerase chain reaction results were studied.

**Results:** We analyzed 23 mothers positive for SARS-CoV-2. Only eight declared having symptoms, mainly headaches, anosmia, and ageusia/dysgeusia. The 23 neonates were negative for SARS-CoV-2 in both reverse transcription polymerase chain reaction tests performed. All of the neonates were born and remained asymptomatic during the 14 days of surveillance time and all of them were breastfed.

**Discussion:** According to our results, rooming-in was safe for newborns of SARS-CoV-2 positive mothers since there was no evidence of perinatal infection. This practice is a well-known way to promote early breastfeeding and encourage maternal-infant bonding.

**Keywords:** COVID-19/transmission; Infant, Newborn; Infectious Disease Transmission, Vertical; Mother-Child Relations; Outcome Assessment, Health Care; Portugal; Postnatal Care; Pregnancy Complications, Infectious; Rooming-in Care; SARS-CoV-2

## Introduction

Since the emergence of coronavirus disease 2019, known as COVID-19, in Wuhan, China, in December 2019, caused by a novel severe acute respiratory syndrome coronavirus 2 or SARS-CoV-2, there are conflicted data regarding the risks and specific effects of SARS-CoV-2 in pregnant women and their newborns.<sup>1-3</sup>

Most COVID-19 infection reported cases in pregnant patients have shown a mild or asymptomatic course of the disease.<sup>2</sup> Regarding newborns, to date, there is scarce evidence concerning the *in utero* transmission of SARS-CoV-2,<sup>2</sup> and the risk of perinatal transmission and the consequent neonate risk of developing COVID-19 during the perinatal period are also unknown.<sup>3,4</sup> Most case series report the birth of normal term newborns to SARS-CoV-2-positive mothers with mild or moderate disease.<sup>1</sup>

However, the paucity of evidence has been challenging the definition of an optimal mother and neonate management.<sup>3</sup> Multiple organizations have released interim guidance for the management of pregnant women with SARS-CoV-2 infection and their newborns.<sup>4</sup> The first guidelines recommended mother-newborn separation, no direct breastfeeding, and early bathing of newborns, given the absence of data on the rates of vertical and perinatal transmission.<sup>4</sup> In the beginning of May, the World Health Organization (WHO),<sup>5</sup> followed by Direção Geral da Saúde (DGS),<sup>6</sup> changed their recommendations and started to promote rooming-in, skin-to-skin contact, and breastfeeding with correct hygiene precautions, considering that the benefits of

1. Pediatrics Service, Children's Department, Hospital de Cascais Dr. José de Almeida, Cascais, Portugal

2. Neonatology Functional Unit, Children's Department, Hospital de Cascais Dr. José de Almeida, Cascais, Portugal

### Corresponding Author

Joana Jonet

<https://orcid.org/0000-0002-8793-8063>

[joana.sousa.soares@hospitaldecascais.pt](mailto:joana.sousa.soares@hospitaldecascais.pt)

Hospital de Cascais, Av. Brigadeiro Victor Novais Gonçalves, 2755-009 Alcabideche, Portugal

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leaving the dyad together, to increase breastfeeding initiation and duration, to reduce maternal and fetal stress, thereby increasing mothers' confidence,<sup>7-10</sup> outweighed the risks.<sup>5</sup>

Our hospital's approach to mothers who were positive for SARS-CoV-2 and their respective neonates was based on the report of relatively few cases of infants confirmed with COVID-19 and mild illness that most of them presented<sup>5</sup> as well as regarding the transitory guidelines provided by various medical societies, especially those from the WHO.

## Methods

We conducted a prospective cohort analysis of all the neonates born of mothers positive for SARS-CoV-2 in a regional hospital in Portugal from April (first diagnosed maternal COVID-19 case) to November 2020.

Since mid-April, universal screening of all pregnant women presenting in labor has been implemented, according to the guidelines from DGS.<sup>11</sup> To those with reverse transcription polymerase chain reaction (RT-PCR) on a nasopharyngeal swab positive for SARS-CoV-2 and to those who are still waiting for the result right before the delivery is given the possibility to room-in with the neonate, unless not permitted by the mother or neonate condition. All of these pregnant women sign an informed consent form after an explanation of the risks and benefits of this practice. These women are also given the following recommendations, which they undertake to comply with:

- Maintaining a distance of 2 m between mother and baby whenever no care is being provided;
- Use of a surgical mask when near the newborn;
- Proper hand hygiene before skin-to-skin contact, breastfeeding, and routine care.

In these deliveries, delayed cord clamping is avoided. Neonates are tested for SARS-CoV-2 by RT-PCR on a nasopharyngeal swab sample within the first 24 hours and again at 48 hours of life. If asymptomatic, regardless the result of RT-PCR, the neonate is discharged with his mother after 48-72 hours. Before discharge, the instructions to reduce the risk of infection transmission are reinforced. It is also explained to the mother that she will be contacted by phone and any changes in the newborn should be reported. The dyad symptoms and routines are assessed in a daily telemedicine visit during 14 days by a neonatologist.

Demographics, maternal signs and symptoms at the delivery, neonatal manifestations during hospitalization and once discharged, perinatal routine care and SARS-CoV-2 RT-PCR results were analyzed. The data were

collected from medical records and the statistical analysis was performed with Microsoft® Excel®. Our purpose is to evaluate the risk of SARS-CoV-2 transmission in newborns born to COVID-19 positive mothers who roomed-in during the first 14 days of life, enabling the safety assessment of our procedures in order to promote the best practices.

## Results

Between April and November 2020, there were 1,438 deliveries, 23 (1.6%) of them were from mothers who were positive for SARS-CoV-2, and in nine cases, the results were known after the delivery (39%). Mean maternal age was 30 years old (range 17-39), 15 (65%) mothers never reported symptoms, and the other eight mothers (35%) reported mild symptoms, mainly headaches, anosmia, and ageusia/dysgeusia. Six mothers (26%) had a known history of contact with a positive case (Table 1).

Of the 23 neonates, 12 (52%) were female, all were born at term and 16 (70%) were born by cesarean section and, of these, at least in 11, this procedure was elective. In 12 (52%) cases, the rupture of amniotic membranes occurred intrapartum and in five (22%) it occurred more than 12 hours before delivery. None required resuscitation. All newborns had SARS-CoV-2 RT-PCR negative results.

We report two admissions to the neonatal special care unit, the first, a healthy term neonate, who was born to the first positive mother for SARS-CoV-2 at our hospital and was admitted due to the mother's early

**Table 1. Characteristics of mothers with COVID-19**

Characteristic	n (%)
<b>Age (years)</b>	
< 18	1 (4%)
18-35	20 (87%)
> 35	2 (9%)
<b>Known trace</b>	
Yes	6 (26%)
No	17 (74%)
<b>Maternal symptoms</b>	
Yes	8 (35%)
No	15 (65%)
<b>Type of symptoms*</b>	
Anosmia or ageusia	5 (63%)
Headache	3 (38%)
Rhinorrhea	1 (13%)

\* Based on symptomatic mothers.

discharge. The second was hospitalized for presenting a patent *foramen ovale*/interatrial communication with a bidirectional shunt and transient high pulmonary vascular resistance in need of surveillance, although he has always remained asymptomatic.

Twenty (87%) neonates were discharged home within 48-72 hours after delivery, as usual in our hospital. The other three had congenital heart disease and two newborns stayed one more day to assess weight recovery.

After discharge and during the 14 days of surveillance, all newborns were breastfed, including the only one who was separated from his mother and did not start receiving breastmilk at the hospital. All neonates were born and remained asymptomatic throughout the surveillance time (Table 2).

Characteristic	n (%)
<b>Sex</b>	
Male	11 (48%)
Female	12 (52%)
<b>Gestational age</b>	
<37	0 (0%)
37-40	13 (57%)
>40	10 (43%)
<b>Rupture of membranes</b>	
intrapartum	12 (52%)
0-18 h	6 (26%)
>18 h	2 (9%)
Unknown	3 (13%)
<b>Born by</b>	
Vaginal delivery	7 (30%)
Cesarean section	16 (70%)
<b>Breastfeeding</b>	
First 24 hours	22 (96%)
First 14 days	23 (100%)
<b>Rooming in with mother</b>	
Yes	22 (96%)
No	1 (4%)
<b>Newborn symptoms</b>	
Yes	0 (0%)
No	23 (100%)

## Discussion

In our case series, no neonate had SARS-CoV-2 virus detected by a nasopharyngeal swab or were symptomatic during the study period, supporting other reports of a low risk of perinatal transmission using the same

protocol.<sup>3,4,9,12,13</sup> In addition, we report a breastfeeding rate of 100% on the 14th day, which compared with the general population breastfeeding rate of 80%, in our hospital, during the same period, suggesting that we have profited from our conservative attitude.

To date, the overall risk of COVID-19 infection due to *in utero* or perinatal exposure for infants remains to be determined,<sup>4</sup> since there were a few cases of neonates born to mothers with perinatal SARS-CoV-2 infection that tested positive for SARS-CoV-2.<sup>2,4-18</sup> In that case, it could explain the reluctance of some guidelines<sup>19</sup> at promoting rooming-in and breastfeeding on those whose mothers were COVID-19 positive. In fact, to our knowledge, the approach to SARS-CoV-2 positive pregnant women in our country has been diverse from center to center, from the beginning of the pandemic to the present. We only know data from one study that was conducted to characterize the management of neonates born to mothers with perinatal SARS-CoV-2 infection in 24 different Portuguese hospitals between April and May 2020 wherein the results were presented at an online congress of the Sociedade Portuguesa de Pediatria held in October 2020. Although the results of this study refer to the beginning of the pandemic and, therefore, cannot be directly comparable, we can point out some differences. It reported five neonates with SARS-CoV-2 RT-PCR positive from 107 positive mothers. From the neonates, 61% were separated from their mothers and 70% were not breastfed. Milk was expressed from 63% of mothers being given to the neonate only in 20% of cases. To discharge, 43% of the hospitals required that the father/caregiver was tested negative and 24% also required the mother to be healed.

However, the recommendation to keep mothers and their children together and promote breastfeeding appears to bring several key benefits that outweigh the potential (and likely mild) harms of COVID-19 transmission to the child.<sup>5</sup> It is clear that the mother and the baby followed separately will cause significant maternal and fetal stress, and it interrupts neonatal physiology.<sup>9</sup> Keeping the mother and baby together can also increase confidence and be protective against stress related to change in the parenting role for some mothers.<sup>7</sup> Rooming-in facilitates mother-infant bonding, which, in turn, positively influences breastfeeding, making exclusive breastfeeding more likely at hospital discharge.<sup>10</sup> The breastfeeding benefits, for both mother and neonate, are numerous and are well known. We emphasize that, centered on the available data, breast milk is unlikely to be a source of SARS-CoV-2 transmission and, on the contrary, the presence of

targeted antibodies in human milk after maternal viral infections has been established including in the case of SARS-CoV and SARS-CoV-2 infection, supporting the plausibility of passive immunity against coronaviruses.<sup>9</sup> Our study presents some limitations, particularly a small sample size which would need a longer enrollment period or a multicenter study. More studies should be held to sustain the hypothesis that a pregnant woman with COVID-19 is unlikely to transmit the virus to her baby during delivery and perinatal care. The time of follow-up of 14 days was another limitation since it is not possible to extrapolate long-term morbimortality or the possibility of turning out positive or symptomatic to SARS-CoV-2 after this period.

Therefore, according to our results, rooming-in and breastfeeding, with the right precautions, should be encouraged, and the national and international guidelines, still contradictory, should be standardized.

#### WHAT THIS STUDY ADDS

- To our knowledge, this is one of the first published case series that reports rooming-in neonates and mothers positive for SARS-CoV-2 in our country.
- The precautions recommended to mothers to keep their newborns COVID-19 free were efficient in preventing the transmission of SARS-CoV-2.
- No evidence of perinatal transmission during labor and puerperium was identified in our experience, despite most newborns experiencing rooming-in and direct breastfeeding practices.
- According to our results, it was safe to allow breastfeeding in positive SARS-CoV-2 mothers.

#### Conflicts of Interest

The authors declare that there were no conflicts of interest in conducting this work.

#### Funding Sources

There were no external funding sources for the realization of this paper.

#### Protection of human and animal subjects

The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

#### Provenance and peer review

Not commissioned; externally peer reviewed

#### Confidentiality of data

The authors declare that they have followed the protocols of their work centre on the publication of patient data.

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#### Awards and presentations

The present study was presented as an oral communication on the 20<sup>th</sup> Congresso Nacional de Pediatria, in November 2019, in Lisbon, Portugal, and received the award Prémio Investigação e Formação Avançada Pfizer Vaccines – Sociedade Portuguesa de Pediatria (Programa Crescemos Consigo) para Internos de Pediatria, for the best study in several pediatric areas.

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### O Internamento Conjunto foi uma Abordagem Segura para Recém-Nascidos de Mães Positivas SARS-CoV-2?

#### Resumo:

**Introdução:** Desde o aparecimento da doença provocada pelo novo coronavírus 2019, conhecida como COVID-19, os dados acerca dos riscos e efeitos do coronavírus 2 que causa a síndrome respiratória aguda grave, ou SARS-CoV-2, em grávidas e recém-nascidos continuam limitados. Ainda existe pouca evidência sobre transmissão *in utero*, e os riscos de transmissão perinatal e, conseqüentemente, do recém-nascido desenvolver COVID-19 são também desconhecidos.

**Métodos:** Em abril de 2020 foi implementado no nosso hospital o rastreio universal a todas as grávidas que se apresentem em trabalho de parto. Aquelas com pesquisa positiva para SARS-CoV-2 têm a possibilidade de permanecer com o recém-nascido no mesmo quarto de isolamento. Os recém-nascidos são testados para o SARS-CoV-2 nas primeiras 24 horas e às 48 horas de vida. Realizámos um estudo de coorte prospetivo de todos os recém-nascidos filhos de mães positivas para SARS-CoV-2, nascidos no nosso hospital entre abril e novembro de 2020. Foram analisados os dados demográficos, sintomas maternos e neonatais à data do parto, no internamento e após a alta, os cuidados

de rotina perinatais prestados e os resultados das pesquisas de SARS-CoV-2.

**Resultados:** Analisámos 23 mães positivas para SARS-CoV-2. Apenas oito referiram sintomas (cefaleias, anosmia e disgeusia / ageusia). Os 23 recém-nascidos tiveram ambas as pesquisas negativas, nasceram e permaneceram assintomáticos durante os 14 dias de vigilância e todos foram amamentados.

**Discussão:** De acordo com os nossos resultados, o internamento conjunto dos recém-nascidos com as mães COVID-19 positivas foi seguro, uma vez que não houve evidência de infeção perinatal. Esta prática é uma forma bem estabelecida de promoção da amamentação precoce e da relação mãe-recém-nascido.

**Palavras-Chave:** Alojamento Conjunto; Avaliação de Resultados em Cuidados de Saúde; Complicações Infeciosas na Gravidez; COVID-19/transmissão; Cuidados Pós-Natal; Portugal; Recém-Nascido; Relações Mãe-Filho; Transmissão Vertical de Doenças Infeciosas; SARS-CoV-2