

CHARACTERISTICS AND CLINICAL MANAGEMENT OF NEONATES WITH COVID-19 – AN INTEGRATIVE LITERATURE REVIEW

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Abstract: INTRODUCTION: In December 2019, the World Health Organization (WHO) announced that Covid-19 is a potentially serious respiratory infection that stands out for its high transmission capacity and global reach. The first case of neonatal COVID-19 in the world occurred on March 29, 2020 in Korea, with the greatest concern being related to the mode of transmission and clinical course.

OBJECTIVE: To describe the characteristics and clinical management of newborns with Covid-19. **METHODOLOGY:** This is an integrative review carried out on the LILACS, SciELO, PubMed and UpToDate websites. The inclusion criteria were articles published in Portuguese, Spanish and English, articles with the full text available, articles published and indexed in the selected databases in the last five years. **RESULTS:** At the end of the search process, articles were found, of which only 14 met the methodological criteria. The articles analyzed showed that vertical mother-to-concept transmission rarely occurs, with most of the time the contamination of the newborn is caused by respiratory droplets, contaminated material or aerosols, so it is extremely important that the health team is aware of the characteristics and forms of clinical management. Among the characteristics, a relationship was seen between the presence of COVID-19 in pregnant women and prematurity, the predominant symptoms in newborns are generally mild (respiratory, gastrointestinal and fever). Asymptomatic newborns or those with mild symptoms (positive for the SARS-Cov-2 virus) must remain with their mother in rooming-in and be breastfed. In symptomatic cases and in need of ventilatory support, the newborn must be transferred to the Neonatal Intensive Care Unit, remaining in an incubator and isolated from others. It is also recommended to use a HEPA (High Efficiency Particulate Arrestance) filter in the

expiratory branch of the mechanical ventilator, perform aspiration in a closed system and use of personal protective equipment by the healthcare team. **CONCLUSION.** The limitation of carrying out this review was the small number of field studies addressing COVID-19, so it is suggested that more studies be carried out in this context and with current and robust samples. Finally, the importance of multidisciplinary teams being aware and attentive to the characteristics and ideal management of newborns with COVID-19 is highlighted in order to carry out individual protection, avoid transmission and identify signs of worsening of the disease.

Keywords: Covid-19; Neonates; Clinical manifestations; Management

INTRODUCTION

In December 2019, the World Health Organization (WHO) announced COVID-19 as an acute respiratory infection caused by the SARS-CoV-2 virus, potentially serious, with high transmissibility and global coverage. Since then, the outbreak has increased rapidly, requiring the WHO to declare an international public health emergency in January 2020, and it was formally considered a pandemic in March 2020 (Toso et al., 2020).

Rodrigues et al (2021) describe that because SARS-CoV-2 is a new virus, many studies were necessary in order to provide information about its clinical manifestations in different populations, such as neonates, who are known to be an age group predisposed to many infections due to their anatomophysiological characteristics,

The first case of neonatal COVID-19 in the world occurred on March 29, 2020 in Korea, with the greatest concern being related to the form of contamination and clinical course. As of October 18, 2020, a total of 6,761 pregnant and/or postpartum women and 1,387 newborns (NBs) carrying SARS-CoV-2 had

been registered in Mexico (Kim, 2021).

Among the clinical manifestations found, Castellanos; Dieppa; Rodriguez (2021) highlight respiratory issues (52%): tachypnea, intercostal retractions and rhinitis; Fever (44%); gastrointestinal (36%): feeding difficulties, diarrhea and vomiting; neurological (18%): hypertonia and irritability, hypotonia, lethargy and apnea; hemodynamic (10%): tachycardia and hypotension, as well as other types (9%): hypothermia, conjunctivitis, rash, edema.

Children of pregnant women with COVID-19 may also experience fetal distress, or experience perinatal asphyxia requiring admission to a Neonatal Intensive Care Unit (NICU), which must have a multidisciplinary team prepared to carry out the ideal clinical management of newborns with COVID-19. based on protocols and guidelines developed to date (Hernández; Jesús, 2023; Cabrejo, 2020).

The objective of this study was to review studies on the characteristics and clinical management of newborns with COVID-19, in order to offer scientific knowledge to health professionals on prevention and control of transmission, correct management, as well as recognizing signs of worsening of this infection.

METHODOLOGY

The study was an integrative review of the literature and was guided by the following guiding question: “What are the characteristics and how is the clinical management of newborns with COVID-19 carried out”; the PICO search strategy (P – population; I – intervention; C – comparison; O – outcomes) was used to formulate the guiding question and descriptors that were combined using the Boolean operators AND / OR.

The PICO strategy for this review was: (P) Neonates affected by COVID; (I)

Multidisciplinary management; (C) Groups that showed clinical signs and symptoms of COVID-19; (O) prevention and control of transmission (Table 1). The search was carried out by two authors independently and at the end the articles were debated.

COMPONENT	DESCRIPTORS
P (POPULATION)	Neonates, newborns, clinical characteristics and manifestations, COVID-19; SARS-CoV-2 infection; Coronavirus 2
I (INTERVENTION)	Management, assistance, management
C (CONTROL)	Children, children, children with COVID-19. Multisystem syndrome
O (OUTCOME)	Infection prevention and control, neonatal outcome

Table 1: Elements of the PICO strategy and descriptors:

The search for articles was carried out through a direct search between the months of August 2023 and January 2024 in four electronic databases: Web of Science and National Library of Medicine (PubMed/Medline), Latin American Literature and Caribe em Ciências da Saúde (Lilacs), Scientific Electronic Library Online (SciELO); UpToDate/ EBSEH - Online database used by the Hospital Services Company (Table 2).

DATABASE/ONLINE LIBRARY	DESCRIPTORS
Web of Science and National Library of Medicine (PubMed/Medline)	COVID-19; Newborn; clinical manifestations, management
Latin American and Caribbean Literature in Health Sciences (Lilacs)	COVID-19; Newborn.
Scientific Electronic Library Online (SciELO)	Covid-19; Newborn.
Update	Covid-19; Newborn

Table 2 - Search strategies used in databases.

Source: Survey Data (2022/2023).

The inclusion criteria defined for the

selection of studies were articles published in Portuguese, Spanish and English, articles with the full text available, published and indexed in the selected databases in the last five years. Articles outside the scope of the topic covered were excluded, single case reports and reviews. Initially, the selection of articles was made separately in each electronic database using the filters there.

After that, the titles were read, followed by the abstracts. After applying the eligibility criteria per platform, a single database was created with the selected articles, where duplicates were removed. Finally, the texts were read in full. The research process was detailed according to the PRISMA flowchart as shown in Figure 1.

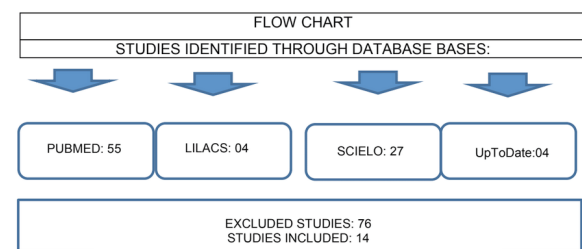


Figure 1 – Flowchart of the study selection process according to PRISMA.

Source: Survey Data (2023/2024).

Based on the combined descriptors, 76 articles were initially found, according to the flowchart above. Of this total, 55 belonged to the PubMed database, 04 from LILACS, 27 from SciELO and 04 from UpToDate. By applying filters from the electronic databases, themselves, based on the eligibility criteria, 14 articles were added. Publications were restricted to 2020, 2021, 2022 and 2023, mostly belonging to SCIELO Periodicals.

For the evaluation and analysis of the included articles, a table was created with a summary of the studies, in descending order, according to their year of publication, which included the following aspects considered relevant: authors and year and results. The

interpretation and discussion of the results were done in a descriptive and analytical way.

RESULTS

The main information from the included articles was summarized in flowchart 1 and discussed later.

DISCUSSION

Covid-19 emerged on the world stage as a disease with a high possibility of morbidity and mortality and as the neonatal population is highly vulnerable, it is important that there is early recognition of clinical signs, appropriate management is carried out to avoid transmission and measures taken sound clinical decisions in order to avoid exacerbations and deaths from the disease (Nanavati et al, 2021).

Among the clinical manifestations observed in newborns with Covid-19, most studies describe that they often present mild symptoms with respiratory compromise, febrile syndrome and gastrointestinal symptoms (Fernández et al, 2020; Anand et al, 2021), however Baquero et al (2020) describe that in their study, high temperature, compromised general condition, gastrointestinal symptoms, without any respiratory manifestations were observed, which is an alert for better investigation by medical professionals.

Among the general characteristics, studies report a predominance of males, brown skin color, average weight of 2,452 kg and average gestational age of 34s and 5 days at birth (López Fuentes et al, 2022; Duarte et al, 2022; Pereira et al, 2023). Prematurity was closely related to Covid-19 in newborns, as in the study by Stofel et al (2021) that 63.4% were PTNB and was the main reason for admission to the NICU (Szczygiol et al; 2022).

Fernandez. et al (2020) studied 40 cases of newborns with COVID-19, 26 of which were acquired in the community and 14 in

Author(s)/Year	Characteristics and clinical management
Fernández <i>et al</i> (2020)	Clinical characteristics: Among 40 cases of COVID-19, 26 were acquired in the community and 14 in the hospital, with mothers and healthcare professionals being the main sources of transmission; 36 newborns were hospitalized, 22 in Intermediate and Conventional Care Units (UCINCO) and 14 in the Neonatal Intensive Care Unit (NICU), 10 newborns were born prematurely. The most common manifestations were upper respiratory tract infection (URTI), febrile syndrome and acute gastroenteritis.
Ashokka <i>et al.</i> (2020)	Management: delayed clamping of the umbilical cord, no skin-to-skin contact, lactation using donated breast milk and screening for the absence of SARS-CoV-2, use of personal protective equipment (PPE) by healthcare professionals
Remaeus <i>et al</i> (2020)	Clinical characteristics: 15% were PTNB due to Covid-19 Management: newborns must not be separated from their mother, breastfeeding is encouraged with the mother wearing a mask.
Baquero <i>et al</i> (2020)	Clinical characteristics: high temperature and impaired general condition, gastrointestinal symptoms without any respiratory manifestations.
Anand <i>et al</i> (2021)	Clinical characteristics: in the sample, 10.7% presented the SARS-CoV-2 virus, mild clinical manifestations, the outcome was hospital discharge, only 1 required ventilatory support by PMT. Management: 93% of newborns tested after 48 hours of life with a negative result had been breastfed in rooming-in.
Nanavatti <i>et al.</i> (2021)	Clinical characteristics: 10.6% of newborns were positive for Covid-19, 80.9% had symptoms, such as clinical manifestations such as involvement of the respiratory system (33.3%) and gastrointestinal (4.8%), 6 (28.6%) of the newborns went to the NICU (4 premature newborns (PTNB) and 2 term newborns (RNT), 2 used invasive mechanical ventilation (IMV)
Stofel <i>et al</i> (2021)	Clinical characteristics: the neonatal positivity rate was 2.8% and few clinical symptoms, 63.4% were premature. Management: the study suggests adaptations for the Brazilian context.
Sobrero <i>et al</i> (2021)	Management: 86.5% of symptomatic newborns had contact with their mother on the first day of life, with the main cause of admission to the NICU being the absence of a caregiver, 19.67% were breastfed. No vertical transmission was identified.
Szczygiol <i>et al</i> (2022)	Clinical characteristics: the study demonstrated a relationship between symptomatic mothers and prematurity (PMT), which was the reason for hospitalization and treatment in the NICU; newborns with acquired infection (after the 14th day of life) presented manifestations such as fever and diarrhea and 28.5% presented symptoms of respiratory failure Management: 16.7% of mothers were separated from their newborns at birth, 83.3% had skin-to-skin contact and rooming-in and 84.5% were breastfed
Duarte <i>et al</i> (2022)	Clinical Characteristics: the newborns had an average weight of 2,452 kg and an average gestational age of 34s and 5 days, 63.3 were premature, 51.4% required ventilatory support.
López <i>et al.</i> (2022)	Clinical characteristics: predominance of Rns with community contamination, males, full-term and with good weight, the asymptomatic form. Isolation was carried out for 5 to 10 days. The manifestations observed were pneumonia, non-focused sepsis, supraventricular tachycardia and dilated cardiomyopathy.
Pereira <i>et al</i> (2023)	Clinical characteristics: the disease predominated in brown neonates with frequent symptoms of respiratory distress, fever and cough; 55% required admission to the NICU and 30.5% used invasive ventilatory support in 2020 and 41.6% in 2021, more than 16% died.
Costa <i>et al</i> (2022)	Management: Five neonates (4%) tested positive for SARS-CoV-2, 56% were separated from their mothers and 68% were not breastfed (68%). In 45% of hospitals, a negative test result was required from the caregiver
Narvey; Finan (2023)	Clinical characteristics: Newborns with Covid-19 at birth mostly present asymptomatic, mild or moderate disease Management: neonates with suspected or confirmed SARS-CoV-2 infection must be placed in an isolated room, if possible, or placed separately in the NICU; if symptomatic and in need of ventilatory support, they must be admitted to a negative pressure isolation room or in a room with a door that can be closed. It is recommended to place a HEPA filter in the expiratory branch of the MV. Postnatal contamination can occur through respiratory droplets from the mother with COVID-19, and is not transmitted through breast milk, so nursing mothers must breastfeed when possible (depending on the clinical status) or encouraged to breastfeed. express milk, always wearing a mask and practicing hand hygiene.

Flowchart 1 – Identification of selection of integrative review studies.

the hospital, with mothers and healthcare professionals being the main sources of transmission. Hospital admission occurred in 36 newborns, 22 in the NICU and 14 in the NICU.

During the COVID-19 pandemic, uncertainty in the modes of vertical and peripartum transmission of SARS-CoV-2 led national and international organizations to recommend the separation of newborns and mothers, as well as the suspension of the breastfeeding process (Costa et al 2022). Ashokka et al (2020) refer to management protocols such as: delayed clamping of the umbilical cord, non-compliance with skin-to-skin contact, lactation carried out using donated breast milk and screened for the absence of SARS-CoV-2, use of protective equipment personal protective equipment (PPE) by health professionals

Sobrero et al (2022) and Narvey and Finan (2023) rule out vertical transmission, describing that contamination of newborns would hardly occur through the transplacental route, birth canal or breastfeeding, with the majority of newborns being infected after birth through transmission of respiratory droplets and/or contact with contaminated material. Szczygiol et al (2022) observed in a tertiary center that only 16.7% of mothers were separated from their newborns at birth, 83.3% had skin-to-skin contact and stayed in rooming-in and 84.5% were breastfed.

Narvey and Finan (2023) describe guidelines for the management of neonates with Covid-19 in which they suggest that neonates with suspected or confirmed SARS-CoV-2 infection must be placed in an isolated room, if possible, or placed separately in the NICU, if symptomatic. and in need of ventilatory support must be admitted

to a negative pressure isolation room or a room with a door that can be closed. It is recommended to place a HEPA filter in the expiratory branch of the MV.

Remaeus et al (2020) also suggest that newborns must not be separated from their mother, breastfeeding must be encouraged with the use of a mask by the mother and Stofel et al (2021) suggest that recommendations (guidelines) regarding postnatal care need to be adapted to the Brazilian reality.

CONCLUSION

Considering the bibliographic findings of the present study, we can conclude that knowing about this topic helps to identify the clinical characteristics and how respiratory management of newborns with COVID-19 must be carried out, contributing to the process of identification, prevention and early treatment of cases. so that this neonatal population does not present factors that may predispose and/or favor illness and mortality from the virus.

Studies have shown that the predominant symptoms of COVID-19 are generally mild (respiratory, gastrointestinal and fever) and management must be carried out from the moment of birth if the pregnant woman is a carrier.

Given this scenario, there is a significant gap in research in this area. Although COVID-19 is a topic covered in numerous studies, the scarcity of research related to clinical manifestations and management of newborns is notable. This finding highlights the need to expand the scope of investigations aimed at this specific population. Therefore, it is expected that this study will not only fill this gap, but also motivate further research and further research in this specific context.

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