SHORT ARTICLE

Newborn epidemiology in the COVID-19 context - Brazil

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Introduction

Coronaviruses (CoVs) are enveloped, crown-like viruses [1], composed of a single-stranded ribonucleic acid (RNA) genome, able to infect vertebrates. In December 2019, a new coronavirus, namedSARS-CoV-2, emerged in Wuhan, Hubei, China, and caused the COVID-19 disease, which has affected millions of lives worldwide. The infection sensitizes the upper and lower respiratory tract [2], thus, the contagion occurs through sneezing and saliva droplets [3,4]. Infected individuals show the first symptoms, approximately, five days after the incubation period [7-9], and the transmission lasts an average of seven days after the onset of symptoms [5,6]. As the virus spreads through the air, the best methods of prevention are hand disinfection with ethanol 70% or soap, use of masks and social distancing, and vaccination [5].

The rapid spread of COVID-19 interferes in the daily lives of billions of people on the planet, from the social, economic, scientific and medical aspects. The pandemic showed, approximately, 214,468,601 confirmed cases and 4,470,969 deaths as of August 2021; in South America: 34,633,766 confirmed cases and 1,065,582 deaths. Brazil is currently considered one of the most important epicenters of the COVID-19 disease, since from the beginning of the pandemic the country has recorded 20,741,815 confirmed cases and 579,308deaths [10].

So far, the SARS-CoV-2 lethality has been mostly associated with elderly or immunocompromised patients [11]. Nonetheless, pregnant women and postpartum women were considered groups of greater clinical vulnerability for COVID-19, due to changes in the immunity mechanism and greater sensitivity to hypoxia [12-14]. This condition is associated with negative outcomes, such as hospitalizations and deaths, and represents a high risk of transmission to the newborn (NB) [15-17].

In Brazil, care for infected pregnant women and postpartum women is associated with the low availability of respirators and intensive care, resulting in high numbers of maternal deaths and poor prognosis for the NB [18]. Postnatal or horizontal transmission of the virus to the NB is more frequent and worsens when the mother is symptomatic [19]. However, evidence of vertical transmission was observed in a study carried out in China.

Therefore, it is notorious the need for control measures and prevention procedures during childbirth and puerperium [20]. The wide diversity of socioeconomic, climatic and geographic characteristics of Brazil are critical to define the profile of the vulnerable population to infection. Moreover, the association of great economic inequalities, the migratory process to big cities and the environmental disorder negatively influences the fight against the disease.

Thus, this study aimed to investigate the main epidemiological variables affecting a population of NB tested for COVID-19 in Brazil and notified for severe acute respiratory syndrome (SARS), from May 2020 to June 2021. In addition, to evaluate the frequencies of comorbidities associated with the population studied, as well as the relationship between symptoms, chronic diseases and COVID-19, and to correlate the data on the presence of chronic diseases and death with

sociodemographic, clinical and behavioral characteristics associated with the condition.

Methods

Study Design and Development

This study is retrospective, it analyzed the secondary database of the SIVEP influenza (Sistema de Informação de Vigilância Epidemiológica, available at. https://opendatasus.saude.gov.br/dataset/bd-srag-2021).

Data from SIVEP influenza reported as Severe Acute Respiratory Syndrome (SARS) in the entire national population during the period from May 2020 to June 2021 were selected, synthesized in a spreadsheet with all fields of the form and considering the cases of SARS regardless of hospitalization. The original spreadsheet generated by the system showed 1,646,375 cases notified in this period.

In this study, the inclusion criteria for data analysis were individuals with RT-qPCR positive for COVID-19 infection notified, which presented from zero to 28 days old. Individuals without adequate time for the collection of the RT-qPCR laboratory test, and incomplete forms t were excluded. Data were filtered and statistically analyzed.

Ethical Approval

The research followed the rules of the resolution 466/2012 – CNS/MS and was exempted from the evaluation of the Human Research Ethics Committee.

Results and Discussion

Sistema de Informação de Vigilância Epidemiológica of flu (SIVEP) allows the evaluation of notifications of infections by COVID-19 throughout the national territory. From the initial worksheet, 283 records of NB were selected, 52.1% of which were female and 47.3% were male. Of these NB, 64.9% were cured of COVID-19, 19.4% died due to COVID-19 complications and 1.2% died from other causes. The average lifespan was 4.06 days, with a median of 2.00, and minimum values of zero days and maximum of 26 days.

Regarding the Brazilian regions where the cases of COVID-19 occurred, 27 (9.6%) were from the South region (nine cases in each of the states); 95 (33.6%) were from the Southeast region (being 46 from São Paulo, 27 from Minas Gerais, 15 from Rio de Janeiro and seven from Espírito Santo); 14 (4.9%) were from the Midwest region (four from Goiás, four from Mato Grosso,one from Mato Grosso do Sul, and fivefrom the Federal District); 137 (48.4%) were from the Northeast

region (13 from Bahia, one from Maranhão, two from Piauí, 74 from Pernambuco, seven from Paraíba, seven from Ceará and 33 from Sergipe); 10 (3.5%) were from the North region (five from Amazonas, one from Pará, one from Roraima, one from Rondônia, and two from Tocantins).

Many of these newborns showed significant symptoms. The presence of fever was identified in 40 (20.7%) of the patients, while, dyspnea was observed in 98 (46.4%). Regarding cough during hospitalization, it was reported that 34 (17.9%) patients presented the symptom.

In addition to the symptoms of the patients, a very important factor that was analyzed is the stay in the Neonatal Intensive Care Units (ICU) during the period of infection. The results showed that 161 of the newborns were referred to the ICUs (69.7%) and 68 (24.0%) did not need to be referred to the Neonatal ICU.

Conclusion

The analyzed data showed that t the region with the most cases in newborns was the Northeast, with Pernambuco state presenting the highest number of COVID-19 cases in NB, followed by the Southeast region (São Paulo state). Some states did not notified cases in NB, such as Acre, Amapá and Rio Grande do Norte. The marjority of patients were very young, displaying an average of 4 days of life, demonstrating that many NB had a clinical condition subsequent to birth, inferring a probable vertical infection. Despite more than 60% of recovery rate for COVID-19, some patients could evolve to death due to other secondary diseases. Additionally, it was observed that most cases were in female patients and that most patients were admitted to the Neonatal ICU. Furthermore, this study revealed that many cases, despite the difficult diagnosis, had the classic symptoms of COVID-19, including fever, dyspnea and cough, being identified in a considerable part of the infected cases.

Ethics approval
This study did not require an evaluation by the Research Ethics Committee, according to the Resolution 466/2012 - CNS/MS.

Informed consent
Not applicable.

Funding

Not applicable.

Data sharing statement

No additional data are available.

Conflict of interest

The authors declare no conflict of interest.

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