



Study of Vertical Transmission of COVID-19 Infection from Infected Pregnant Mothers to Neonates

Authors

**Dr Shruti Dhale¹, Dr Anju Paul^{2*}, Dr Shaista Parween³, Dr Snehal Rathod⁴,
Dr Kuldip Shimpi⁵, Dr Kapil Thorat⁶**

¹M.D. Pediatrics, Associate Professor, Department of Pediatrics, Grant Govt Medical College, Mumbai

²Junior Resident, D.C.H., Department of Pediatrics, Grant Govt Medical College, Mumbai

^{3,4,5,6}Junior Resident, M.D. Pediatrics, Department of Pediatrics, Grant Govt Medical College, Mumbai

*Corresponding Author

Anju Paul

Junior Resident, D.C.H., Department of Pediatrics, Grant Govt Medical College, Mumbai, India

Abstract

Introduction: COVID-19 is an emerging rapidly evolving pandemic originated from Wuhan city of Hubei province in China. COVID-19 has rapidly spread to affect over 200 countries worldwide. Children account for 1-5% of diagnosed COVID-19 cases. The clinical characteristics, disease progression and prognosis appear to be significantly milder in pediatric population compared to adults. As per current guidelines from Federation of Obstetrics and Gynecological societies of India (FOGSI), NNF, IAP suspected and confirmed COVID positive mothers should be delivered in separate delivery rooms and operation theaters. There are a few published cases of COVID-19 occurring in pregnancy and the possibility of mother fetal vertical transmission. There is a concern that the fetuses may be at risk of congenital COVID-19.

Methodology: It is a prospective cohort study and was conducted in Cama and Albless hospital, Mumbai on newborns admitted to covid positive ward with covid positive mother. Duration of this study was 3 months and 200 newborns were included. All newborns born to covid positive mothers were tested with RT PCR for COVID-19 and results were complied.

Results: Among 200 neonates reported born to covid-19 positive women, vertical transmission is suspected in 6 neonates(3%) and was confirmed by a positive RT-PCR.

Conclusion: It is evident from the present study that there is only limited, i.e 3% of vertical transmission of COVID from infected mother to newborn.

Keywords: RT PCR of Covid -19, Vertical transmission of COVID-19.

Introduction

Coronavirus disease (COVID-19) is caused by SARS-CoV2 and represents the causative agent of a potentially fatal disease that is of great global public health concern. Based on the large number of infected people that were exposed to the wet animal market in Wuhan City, China, it is suggested that

this is likely the zoonotic origin of COVID-19. Person-to-person transmission of COVID-19 infection led to the isolation of patients that were subsequently administered a variety of treatments. SARS-CoV-2 uses the SARS-coronavirus receptor, angiotensin-converting enzyme 2 (ACE-2) for entry host cells. ACE-2 is a surface molecule highly expressed in AT2 cells of lung,

along with esophageal upper epithelial cells and absorptive enterocytes from ileum and colon which indicated digestive system along with respiratory systems is a potential route for SARS- CoV- 2. The expression level of ACE- 2 in Asian populations is significantly higher than that in European and American populations, and ACE- 2 on male cells are higher than on female cells, which can partially explain the incidence rate of novel coronavirus pneumonia are higher in male and Asia.

Extensive measures to reduce person-to-person transmission of COVID-19 have been implemented to control the current outbreak. Special attention and efforts to protect or reduce transmission should be applied in susceptible populations including children, health care providers, and elderly people. Among patients with pneumonia caused by SARS-CoV-2 (novel coronavirus pneumonia or Wuhan pneumonia), fever was the most common symptom, followed by cough. Bilateral lung involvement with ground-glass opacity was the most common finding from computed tomography images of the chest.

The diagnosis of COVID- 19 is based on comprehensive contact and travel history and precise laboratory tests. Current diagnostic tools were the nucleic acid or virus gene tests. Samples included nasopharyngeal swab, sputum, and secretion of the lower respiratory tract, blood, and feces. The nasopharyngeal swab is the most common specimens, however, its detection positive rate is less than 50%. Repeated testing is necessary for improving the positive rate.

As per current guidelines from Federation of Obstetrics and Gynecological societies of India (FOGSI), NNF, IAP, neonatologist must wear protective equipment (including hats, goggles, protective suits, gloves, N95 masks, etc) to resuscitate neonates delivered by confirmed and/or suspected COVID- 19 puerperant. If the puerperant is positive for SARS- CoV- 2, the neonate must be isolated, then detected SARS- CoV- 2. Currently, controlling infection to prevent the spread of SARS- CoV-2 is the primary intervention being used. COVID- 19 can result in asymptomatic to severe

illness, fortunately, children without underlying diseases appeared to have mild disease. The disease condition of the neonates was also minor. Though this new virus comes out without specific antiviral drugs treatment, neonatologist needs more virological, epidemiological, and clinical data to treat and manage COVID- 19.

Materials and methods

It is a prospective cohort study and was conducted in Department of Pediatrics, Cama and Albless hospital and Grant Government Medical College, Mumbai. The study was conducted on newborns admitted along with covid positive mother were tested for COVID 19 with RT-PCR. Within the data collection period of 3 months, a total of 200 newborns, with covid positive mothers were enrolled in the study. After obtaining written informed consent in the local vernacular language, the newborns who were fulfilling the inclusion criteria were included in the study. These include newborns born at Cama and Albless hospital and newborns transferred from Grant Government Medical College, Mumbai whose mothers were tested positive for COVID -19 by RT PCR. All these newborns were tested for RTPCR of COVID 19 and results were complied.

Inclusion Criteria

All newborns of covid positive mothers confirmed by RT-PCR.

Exclusion Criteria

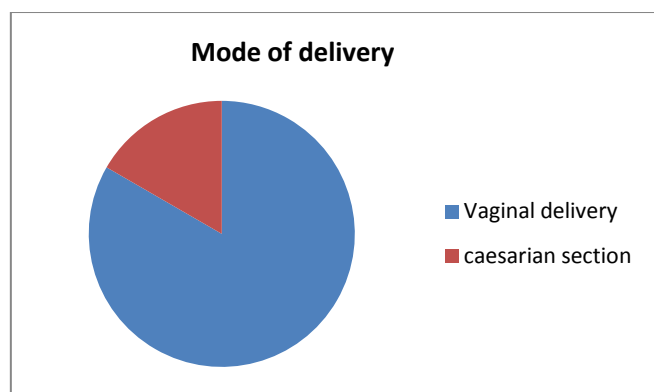
- Newborns born to covid negative mothers by RT-PCR.
- Babies more than 1 month/30 days of age

Results and Observation

- Incidence of covid positive newborn among covid positive mothers was found to be 3%.
- Incidence of covid positive newborn born by vaginal delivery to covid positive mothers was found to be 3.26%.
- Incidence of covid positive newborn born by caesarian section to covid positive mothers was found to be 2.38%.

All 6 newborns who were covid positive were asymptomatic.

Graph 1: Showing mode of delivery of covid positive newborns



In this study, among 200 neonates with COVID positive mothers, 5 neonates (3.2%) were born of vaginal delivery and 1 neonate (2.3%) was born of caesarean section.

Table1: Showing mode of delivery of covid positive newborns

| MODE OF DELIVERY | NO. OF COVID POSITIVE MOTHERS | NO. OF COVID POSITIVE NEONATES |
|-------------------------|-------------------------------|--------------------------------|
| NORMAL VAGINAL DELIVERY | 153 | 5 |
| CAESARIAN SECTION | 42 | 1 |
| TOTAL | 200 | 6 |

Conclusion and Recommendations

We can conclude from the above study that vertical transmission of COVID 19 from an infected mother to the newborn infant is minuscule, as compared to the infective rate in adult population. It is imperative that there should also be studies to identify why vertical transmission is so significantly large in newborns born via vaginal delivery than in caesarian section and its repercussions. It is also reassuring that neonatal COVID infections seem to be mainly asymptomatic and has a benign course. But it is important to emphasize that the neonatologist have to be in watch out for any clinical deterioration in a these neonates and they have to be investigated and managed appropriately and aggressively if they show any signs of respiratory illness or sepsis

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