

# SARS-CoV-2 in Newborn babies – A Review Article



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Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) pandemic is a public emergency that affects all ages including newborn babies. As of date, the clinical disease is less severe in the neonatal population. The long-term consequences of SARS-CoV-2 in affected newborn babies are yet to be ascertained. This article aims to disseminate the latest scientific evidence regarding COVID, and its impact on the neonatal population.

**Keywords:** COVID, Neonate, Perinatal, Pneumonia

## 1. Introduction

The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has become a world-wide healthcare crisis, infecting people of all ages. The data regarding COVID-19 in newborn babies is scarce mainly because of low testing in asymptomatic babies, and also because of lack of registries documenting the same. Though the percentage of newborn babies affected seems to be low, there are a few reports mentioning about Multisystem inflammatory syndrome in neonates [1]. Here we review the mode of transmission, the possible outcomes and the current recommendations regarding care of a COVID positive neonate.

## 2. Covid - 19

Coronavirus is a zoonotic virus with a single stranded RNA genetic material. Alpha and Beta coronavirus can cause disease in humans. In the year 2002, there was an outbreak of Severe Acute Respiratory Syndrome Corona Virus 1 (SARS-CoV-1), and in the year 2012, Middle East Respiratory Syndrome Corona Virus (MERS-CoV) outbreak happened.

It was in December of 2019, that Wuhan in China started reporting patients with pneumonia of unknown aetiology. These patients were investigated and the causative organism was found to be a new strain of beta-corona virus, never reported before. On January 30, 2020, this outbreak was declared as a Public Health Emergency of International Concern (PHEIC) by the World Health Organisation. In February, the virus was named as 'SARS-CoV-2' by the International Committee on Taxonomy of Viruses.

Genome sequencing of SARS-CoV-2 showed around 79% similarity with SARS-CoV-1, and around 50% similarity with MERS-CoV [2].

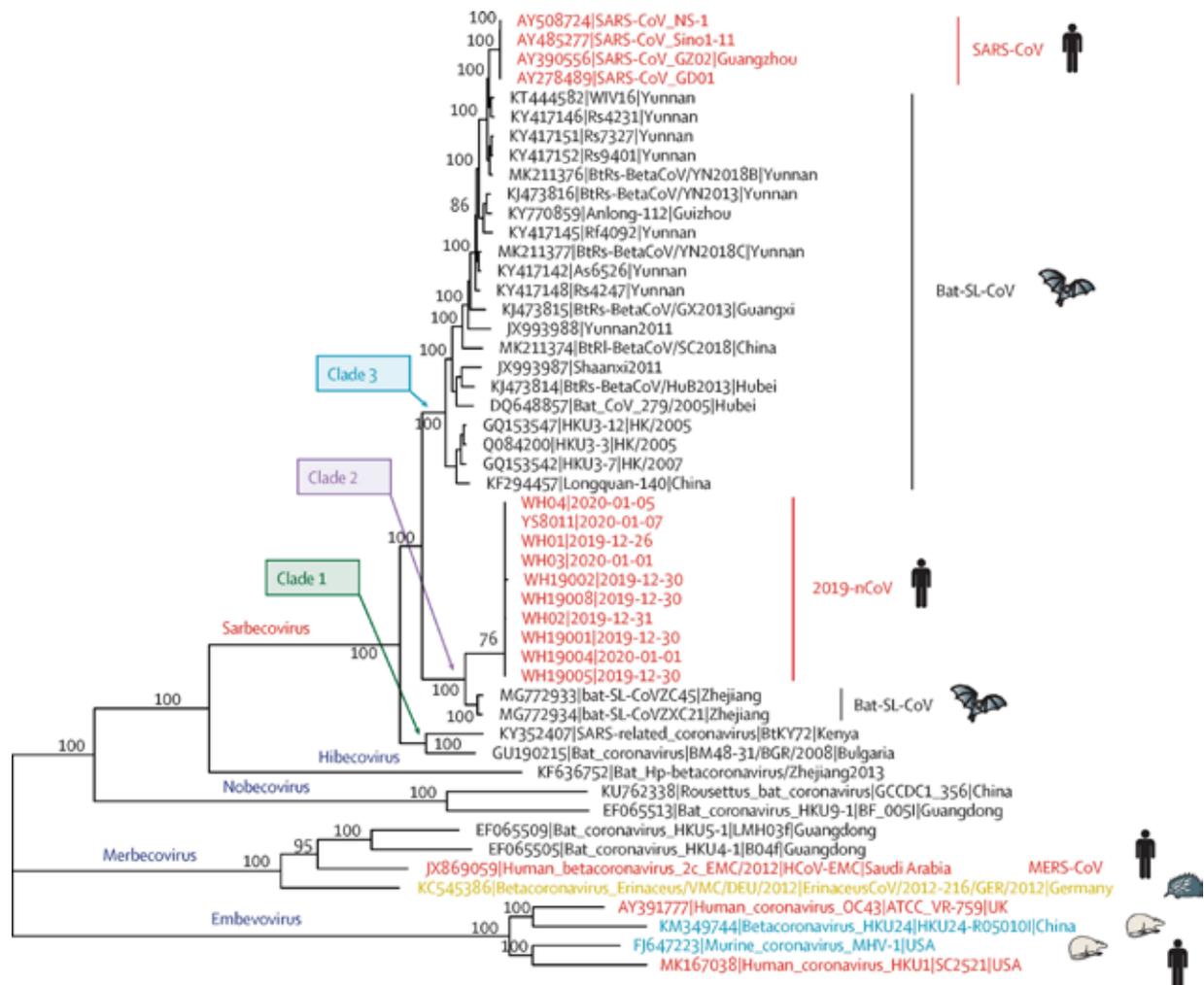


Fig 1: Phylogenetic analysis [2]

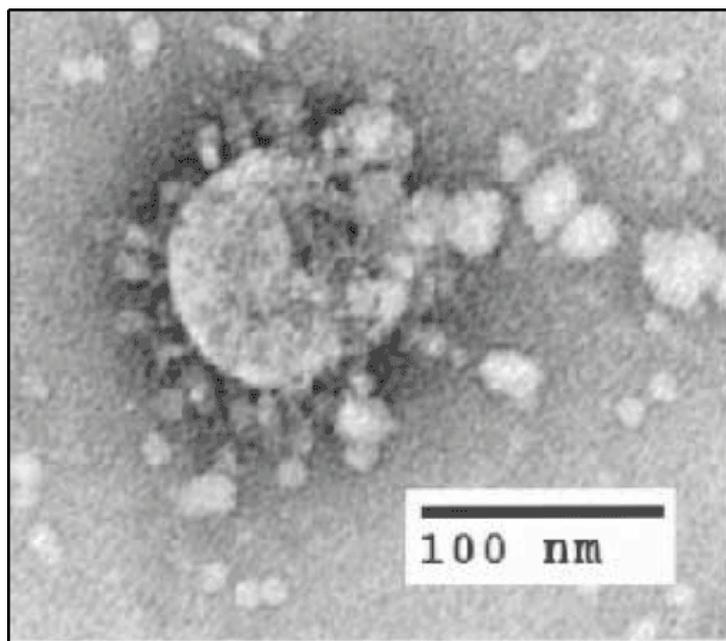


Fig 2: SARS-CoV seen on Negative stain electron microscopy (with club-shaped surface projections) [3]

### 3. Transmission of Covid to a Neonate

Three possible modes of transmission exist [4, 5].

- A. Intra-uterine mode where viral particles are transmitted to the foetus in-utero seems to be rare, but may be possible.
- B. Intra-partum mode is the transmission during delivery due to exposure to maternal fluids.
- C. Post-partum mode or the horizontal transmission where a newborn baby gets infected after birth (from infected mother or others) seems to be the most common mode. This occurs mainly by respiratory droplets. It is important to note that breast milk is an unlikely source of infection [explained later].

### 4. Clinical Profile

Most of the infected newborn babies are either asymptomatic, or have only mild symptoms. Newborns with symptoms have 3 times more chances of getting admitted in ICUs [6]. The common clinical features seen in COVID infected newborns are fever, rhinorrhoea, cough, respiratory distress, poor feeding and lethargy. It is important to understand that these clinical features of COVID mimic those seen in any neonatal sepsis.

#### 4.1 Early Onset Neonatal Covid:

1-3% of newborns born to COVID positive mothers are noted to have infection [4]. The chances seem to be more if the mother tests positive around the time of delivery. Prematurity and low birth weight also seems to be more frequent in these cases [7].

#### 4.2. Late Onset Neonatal Covid:

The majority of symptomatic COVID positive newborn babies are diagnosed after 5 days of life. Post-natal (horizontal) transmission from the mother or healthcare workers may contribute to this type.

Though Multisystem inflammatory syndrome in children (MIS-C) is more common in older children with a median age of 5-9 years, 4% of MIS-C occurs in children <1 year of age, and has been rarely reported in neonates [8].

Lab investigations are non-specific for COVID and include leucocytosis, lymphopenia, thrombocytopenia, elevated CRP and elevated lactate. RTPCR remains the gold standard for confirmation.

### 5. Management of a Newborn Born to Covid Positive Mothers

Babies born to mothers who are COVID positive should be carefully watched for symptoms of COVID infection. Testing for SARS-CoV-2 RNA with Reverse Transcriptase–Polymerase Chain reaction (RT-PCR) should be done at 24-48 hours of life [4].

Asymptomatic COVID positive neonates do not need any specific treatment.

Treatment of symptomatic COVID positive neonates is largely supportive. Respiratory distress may

require Oxygen therapy/Continuous Positive Airway Pressure (CPAP) /Heated Humidified High Flow Nasal Cannula (HHHFNC) or even mechanical ventilation. Other co-morbidities like prematurity or low birth weight need to be addressed accordingly. There is scarcity of evidence to recommend the use of anti-viral drugs or steroids in symptomatic neonates with COVID. However, Neonatal Multisystem inflammatory syndrome (MIS-C) may require the use of intravenous steroids.

## 6. Breastfeeding in Covid

The World Health Organization (WHO) categorically recommends COVID positive mothers to breastfeed their babies [9]. This is mainly because the benefits of breastfeeding outweigh the potential risk of transmission. So far, transmission of live virus through breast milk causing infection to newborns has not been documented. Also, breast milk has immunological factors like IgA, which may protect the babies against infections.

UNICEF advises 3 steps to be followed when a COVID positive mother feeds her baby [10]. They are the 3 Ws:

1. W – Wear properly-fitting mask while breastfeeding your baby.
2. W – Wash hands with soap before and after touching your baby.
3. W – Wipe and disinfect all surfaces regularly.

## 7. Conclusion

COVID-19 is a relatively new entity, and whatever facts we have at present are miniscule. The data on neonatal COVID are further scarce, thereby limiting the quality of recommendations regarding care. Long-term consequences in neonates affected with COVID are yet to be seen. At present, ramping up vaccinations and following appropriate preventive measures like face masks, hand hygiene, and social distancing seem to be the only ways to control COVID-19.

## 8. References

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