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Novel Coronavirus Disease (Covid -19) In Newborns

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Abstract:*Novel Coronavirus has taken the world by storm since its outbreak in December,2019 in China.Millions of people all over the world have been affected.Few lakh people have succumbed to this deadly virus in the last few months.However,newborn and children seem to be less affected by this deadly virus.Most of them are asymptomatic or mildly symptomatic.Thus,care of newborn is rather unaltered in Covid 19 patients.Hovever,standard protocol must be followed for care of newborn who is Covid positive.*
Keywords:*Coronavirus,newborn,asymptomatic*

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I. Introduction

Novel Coronavirus (COVID-19) or SARS-CoV 2 (Severe Acute Respiratory syndrome coronavirus 2) is the seventh member of the coronaviridae family that has the potential to infect humans.After a mass breakout in the Wuhan province of China,it has gradually spread to entire world despite every measure to contain the virus .On 11th March,2020 WHO declared it as a global pandemic.Though all age groups are susceptible to this deadly virus,children seem to have less clinical symptoms. Data regarding the exact effect of coronavirus on newborn is inadequate till date.[1]

II. Mode of transmission in newborn

Whether transmission can occur from mother to infant vertically or via breast milk has not been clearly established yet.In a recent research article, Dong et al[2]speculate the possibility of vertical transmission of the virus in a term infant,from mother with SARS CoV-2 pneumonia at 34 weeks of gestation.They found high level of virus specific IgM and IgG in the newborn two hours after birth. The newborn did not develop any symptoms and nasopharyngeal swab was negative.However,high antibody titre was suggestive of in-utero transmission of virus.Since amniotic fluid or cord blood could not be tested,definite conclusion could not be drawn.

Data regarding less transmission of virus during delivery by caesarean section as compared to vaginal delivery is inadequate.Hence, choice of delivery method must depend on maternal co-morbidities and involved antenatal or fetal factors.Delivery should be done in a separate operation theatre with negative pressure air circulation.All health professionals involved in operation must use personal protective equipment.

However,chance of preterm delivery is high in mother with SARS-CoV 2 probably due to chronic hypoxia.Mother may be given antenatal steroid in case of chances of preterm delivery.

Very recently,Zeng et al[3] reported a series of 33 infants from mothers with COVID-19,three of whom were symptomatic (one of which was a preterm with gestational age of 31 weeks) with a radiological picture of pneumonia.The rectal and nasopharyngeal swab was positive in all three newborns.There was no mortality and the swab was negative for all three newborn by 6th or 7th day.Since cord blood or amniotic fluid could not be tested, whether the infection was intrauterine or postnatal transmission could not be determined.The preterm newborn needed mechanical ventilation but there was no mortality.

Transmission through breastmilk could not be confirmed due to lack of adequate data.Chen et al[4] reported that all breast milk sample from 9 mother from SARS Cov2 positive was negative for virus.Hence ,breastfeeding is not contraindicated for Covid positive mother.In all socio–economic setting,breastfeeding improves survival and provides lifelong health and developmental advantage to newborn and infants.Breastfeeding also improves the health of the mother.

Mother should wash hands frequently with soap and water or use alcohol-based hand rub,especially before touching the baby.Mother should wear a medical mask while feeding.It is important that mother must replace masks as soon as they become damp and dispose the mask immediately.Mother must never re-use the mask,nor touch the front of the mask.Mother must sneeze or cough into a tissue,immediately dispose of it and use alcohol-based hand rub or wash hands again with soap and clean water.The health care staff must regularly clean the chamber of the mother and child.All surfaces must be sanitized immediately.Breastmilk pumps,milk storage containers and feeding utensils need to be appropiately cleaned after every use.

Wet-nursing (another woman breastfeeds the child) may be an option depending on acceptability to mothers/families,national guidelines ,cultural acceptability,availability of wet-nurses and services to support the mother.[5]

III. Symptoms

Clinical features of infected newborn,especially preterm infants,might be non specific and include acute respiratory distress syndrome,temperature instability(fever),gastrointestinal(diarrhoea) and cardiovascular dysfunction.Critically ill infant may present as shock.All infants suspected of Covid-19 infection should be isolated and monitored.Majority of newborn may be asymptomatic which is attributed to immaturity of immune system.[6]

In the largest case series of Covid 19 to date in mainland china,(72,315 cases,updated to February,2020) 416 cases(1%) were less than one year of age but no newborn cases were reported[7].The reason why children are less suspectible to COVID 19 as compared to adults is still unclear.Children are generally more susceptible to viral infection.Otto et al.[8]showed that children who recieved combined diphtheria,pertussis,tetanus,Hib and poliomyelitis vaccination within third month of life had significantly less symptomatic infections than those with delayed or partial immunization..

Another hypothesis suggests that Covid 19 binds to ACE -2 receptor (angiotensin converting enzyme-2),a membrane –bound aminopeptidase highly expressed in epithelial cells of lung and gastrointestinal tract.It is possible that ACE 2 tissue distribution differs between adults and children and the maturity and function (e.g. binding ability) of ACE2 in children may be lower than in adult.[9]

Furthermore,we cannot exclude that pediatrics SARS-Cov2 infections are often unrecognised or underestimated,as they may remain asymptomatic or manifest as mild,non specific symptoms such as hypo reactivity,headache,cough,nasal congestion ,runny nose ,and expectoration.Most children have only moderate to low grade fever,or even none.Smaller infants can present primarily with gastrointestinal symptoms such as diarrhoea,abdominal distension and food aversion.

Newborns ,in particular if preterm,need a more close and cautious observation,because they are more likely to present as insiduous and non specific symptoms as lethargy and dehydration.

IV. Need for Testing of COVID -19 in newborn

a) If newborn is born to mother with suspected or confirmed COVID-19
b) Related to cluster outbreak or exposed to infected relatives or caregivers.

The virus can be detected by Real time Polymerase Chain Reaction (RT-PCR) in bronchoalveolar lavage fluid,sputum,saliva and particularly in nasopharyngeal swab which are the gold standard for diagnosis.The incubation period of Covid virus ranges between 2 to 14 days.[10,11]

Pulmonary lesions are shown more clearly by chest CT scan than X-Ray examination,common findings include ground glass opacity,multiple bilateral lobular and segmental consolidation,in particular in the peripheral lung.[12]

The baby should be isolated till COVID status can be accertained.

<u>If Mother is COVID positive but Baby is Covid Negative:</u>

Rooming in of child may be allowed along with breastfeeding if mother is stable enough.Kangaroo mother care may also be practised after mother wears a mask and uses proper hand hygiene.Baby should be monitored with Covid testing from time to time till mother is disease free.

If Mother is ill and unable to breastfeed,expressed breastmilk may be given to baby.Caregiver may use proper precaution while expressing breast milk and feeding the baby.Feeding from breast should be reestablished as soon as mother is well.

If the breast milk is inadequate or mother is critically ill,top feed or donor milk may be used to feed the new born till feeding can be reestablished.

<u>IF BABY IS POSITIVE</u>:

Baby should be isolated and kept in quarantine for 14 days in negative pressure isolation room. Standard protocol of Covid 19 should be followed in baby with Spo2 monitoring.In case the newborn deteriorates,he must be shifted to specially designated NICU for COVID treatment.Newborn with Acute respiratory distress may need high flow oxygenation or mechanical ventilation.Trial of Immunoglobulin may be done in case of critically ill newborn.Role of any antiviral or antibiotic has not yet been established in the treatment of Covid -19.[13]

Newborn could be discharged after resolution of respiratory symptoms,lack of fever for at least 3-5 days and two nasopharyngeal swab negative over 48 hours.[14]

There is still a lot of research needed to conclude about effect of COVID 19 in newborns and whether it may affect intrauterine growth and development.Effect of Coronavirus on the development of congenital anomaly is yet to be known.There is need for study on a large scale before drawing definite assumptions.

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