

## Presenting clinical features of COVID-19 in neonatal age group

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### Abstract

**Background :** In December, 2019 a cluster of pneumonia cases spread in Wuhan City, Hubei Province, China caused by a novel corona virus (named as "2019-nCoV"). Although it is thought to be a disease of adult but it can occur in children and neonates also.

**Objective :** The aim of this study was to see the incidence of Neonatal COVID-19 and its mode of presentation in neonatal age group.

**Methods :** This cross sectional study was done in Dhaka Shishu (Children) Hospital from April, 2020 to October, 2020. All suspected neonates for COVID-19, RT PCR were done from nasopharyngeal swab. Suspecting sign were fever, respiratory difficulty, reluctant to feed, neonate not responding to conventional treatment, or referred from endemic area or having any household contact. Routinely RT PCR was done preoperatively who needed surgery. Then all the data were collected and analyzed using Statistical Package of Social Science (SPSS), version 26.

**Results :** Total 5521 neonates were admitted and 299 neonates were suspected for COVID-19 infection during this study periods and undergone RT PCR, out of which 47 cases were test positive. The incidence of COVID-19 cases was 0.85% among hospitalized neonates. Thirty one were male and 16 were female. Male female ratio was 1.9:1. Thirty-three cases admitted in medicine and 14 cases in surgery division. Twenty three (49%) cases presented symptoms after 7 days of age and 13(28%) cases got admitted within 3 days, among them 2 cases were admitted at 24 hours of age with symptoms. Respiratory difficulty (25.5%), convulsion (19.1%), fever (17%) and reluctant to feed (17%) were common presenting symptoms. The associated diagnosis with COVI-19 cases were mostly perinatal asphyxia, septicemia and pneumonia. Regarding chest X-ray, one neonate had patchy opacities in right lower lobe, another had bilateral ground-glass opacity and in case of third one few patchy opacities was found in the right perihilar region. Out of 47 positive cases 23 patients could discharge after improvement, 14 patients referred to COVID specialized hospital, 2 cases went as LAMA (Leave against medical advice) and 8 patients died at our hospital.

**Conclusion :** In this Study the incidence of COVID-19 in newborn was 0.85% among hospitalized newborn. The common clinical features were respiratory difficulty, convulsion, fever and reluctant to feed. It could not be differentiated whether these clinical features were due to COVID-19 or associated diseases.

**Key words :** Neonatal Covid-19, Corona

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### Introduction

Last year in December, 2019 a cluster of pneumonia cases spread in Wuhan City, Hubei Province, China.<sup>1</sup> It was caused by a novel corona virus (named as "2019-nCoV").<sup>1</sup> It then emerged as an epidemic in china.<sup>2</sup> Later it spread in Italy, USA then most of the countries of the world.<sup>3</sup> At last WHO declared this disease as pandemic and named as COVID-19.<sup>1</sup> The first cases of COVID-19 appeared at 8 march, 2020 in Bangladesh.<sup>4</sup>

Initially it was reported that this disease only

affected adult population but subsequently children were affected and even infants were reported as affected. Now several cases of COVID-19 in newborn were found.<sup>5</sup> Though little is known about neonatal COVID-19 and intra uterine transmission of this virus.<sup>6</sup>

It is thought that the transmission of SARS-CoV-2 virus to newborn occurs through respiratory droplets postnatally from exposed mother, relatives or other care givers.<sup>7</sup>

In newborn COVID-19 is mild disease in majority cases. Different data has been described that

infants (<1 years) may be at higher risk for severe illness from COVID-19 compared with older children.<sup>7,8</sup>

The clinical features of COVID-19 in newborn are fever, lethargy, cough, tachypnea, increased work of breathing, vomiting, diarrhea, and feeding intolerance or decreased intake.<sup>7</sup> These features also found in common neonatal illness like TTN, RDS septicemia etc.<sup>7,9</sup>

The aim of this study was to see the incidence of neonatal COVID-19 and its mode of presentation in neonatal age group.

### Material and Methods

This cross sectional study was done in Dhaka Shishu (Children) Hospital (DSH) from April, 2020 to October, 2020. All neonates admitted at DSH are out born and referred from different corner of Bangladesh. This hospital was not a COVID designated hospital up to mid-July. Then a separate corona unit was formed. The ethical clearance was taken from the ethical committee of the hospital. After admission all newborn underwent thorough investigations like CBC, CRP, Blood C/S, S. electrolytes, S. calcium, RBS, x-ray chest (CXR), according to patient's clinical findings. During this period all the admitted newborns were looked for any suspicion for COVID-19 infection. Neonates who have any one of the following sign symptoms were suspected for COVID-19 : fever, respiratory difficulty, reluctant to feed, neonate not responding to conventional treatment, or referred from endemic area or having any household contact. Neonates who were suspected for COVID-19, RT PCR were done from nasopharyngeal swab. It is also our hospital protocol to do RT PCR of babies preoperatively who needed surgery. Nasopharyngeal swabs were collected by trained health technician for RT PCR and it was done at microbiology lab of Dhaka Shishu (children) Hospital, which is a government approved laboratory for COVID-19. It is taken 24 to 48 hours to collect the report. Then all the data regarding gender, gestational age, clinical features, associated diseases, laboratory investigations, mortality etc were recorded in a predesigned proforma. Finally, all recorded data were analyzed by using Statistical Package of Social Science (SPSS) version 26.

### Results

Total 5521 neonates were admitted and 299 neonates were suspected for COVID-19 infection during this study periods and undergone RT PCR, out of which 47 cases were test positive. The incidence of COVID-19 cases was 0.85% among hospitalized neonates. Thirty-one were male and 16 were female. Male female ratio was 1.9:1. Forty-three of them were term and 4 were late preterm. Thirty-three cases were admitted in medicine and 14 cases were in surgery department.

Twenty three (49%) cases presented symptoms after 7 days of age and 13(28%) cases got admitted within 3 days, among

them 2 cases were admitted at 24 hours of age with symptoms (Fig. 1).

Respiratory difficulty (25.5%),convulsion (19.1%), fever(17%) and reluctant to feed (17%) were common presenting symptoms (Table I).

The associated diagnosis with COVI-19 cases were mostly perinatal asphyxia, septicemia and pneumonia (Table II). Regarding chest X-ray, 3 neonates showed abnormal findings. one showed patchy opacities in right lower lobe, another showed bilateral ground-glass opacity and third one revealed few patchy opacities in the right perihilar region.

Among 47 positive cases 23 patients were discharge after improvement, 14 patients referred to COVID specialized hospital, 2 cases went as LAMA and 8 patients died at our hospital.

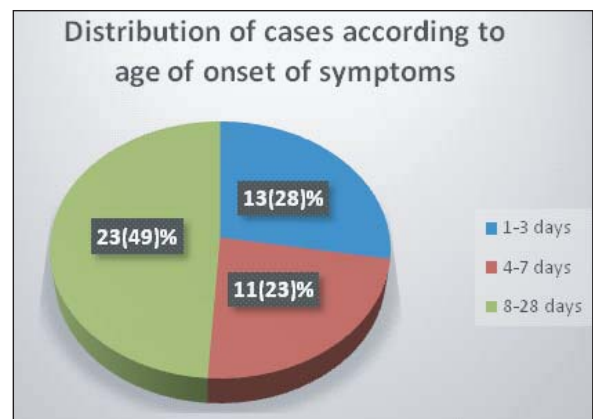


Figure 1: Distribution of cases according to age of onset of symptoms

Table I : Clinical symptoms at admission (47 cases)

Symptoms*	No (%)
Lethargy	2(4.2)
Convulsion	9(19.1)
Reluctant to feed	8(17)
Jaundice	5(10.6)
Respiratory difficulty	12(25.5)
Fever	8(17)
Cough	3(6.4)
Loose watery stool	1(2.1)
Vomiting	2(4.2)

Table II : Associated diagnosis with COVID-19(47 cases)

Diseases	No (%)
Perinatal asphyxia	12(25.5)
Septicaemia	10(21.2)
Pneumonia	3(6.4)
Congenital heart diseases	3(6.4)
Pneumonia with sepsis	2(4.2)
AKI with congenital renal anomaly	2(4.2)
Meningitis	1(2.1)
Surgical Conditions	14(29.8)

Table III : Outcome of Cases(47)

Variable	No (%)
Discharge with advice	23(48.9)
Referred to covid19 hospital	14(29.8)
LAMA*	2(4.2)
Mortality in hospital	8(17)

\*Leave against medical advice

## Discussion

Total 5521 neonates were admitted and 299 neonates were suspected for COVID-19 during this study periods and undergone RT PCR, out of which 47 cases were test positive. In this study the incidence of COVID-19 cases was 0.85% among hospitalized neonates. Thirty-one were male and 16 were female. Male female ratio was 1.9:1. Forty three of them were term and 4 were late preterm. Thirty-three cases admitted in medicine and 14 cases in surgery division.

There are limited data on the impact of the current COVID-19 outbreak on newborns, and on the pediatric population. A systemic review was done by Trippela G et al. which showed 16 neonates were COVID positive out of 191 tested neonates<sup>6</sup>. Duran P reviewed 6 articles and found 13 positive neonates among 222 suspected cases<sup>10</sup>.

In this study 23 (49%) cases presented symptoms after 7 days of age and 13(28%) cases got admitted within 3 days, among them 2 cases were admitted at 24 hours of age with symptoms. Trippela G et al. in their study found 7 neonates out of 16 had symptoms after 15 days of life.<sup>10</sup> Some other case reports showed babies presented after 2 weeks of life.<sup>2,11,12</sup> Earliest positive case was found after 16 hours in USA.<sup>13</sup> We could not able to perform mother's COVID-19 test, as all the patients were out born and coming from all over the country.

In this study respiratory difficulty (25.5%), convulsion (19.1%), fever (17%) and reluctant to feed (17%) were common presenting symptoms. Fever was also most frequent symptom, followed by gastrointestinal symptoms, respiratory distress, and mild respiratory symptoms (cough, rhinitis) found in the review article by Trippela G et al. which is quite similar to our study.<sup>8</sup> A cohort study was done at Wuhan, China and result showed 3 neonates were COVID-19 positive among 33 and their common symptoms was shortness of breath.<sup>14,15</sup> Among 13 positive neonates from different study which was described by Duran P et al. found that 5 neonates had fever, 4 respiratory problem and others healthy during diagnosis.<sup>10</sup> Case reports by different authors showed fever, tachypnea, reduced feeding were presenting symptoms<sup>2,12</sup>. Case reports without any symptoms were also there.<sup>13,14</sup>

In chest X-ray of this study, one neonate showed patchy opacities in right lower lobe, another showed bilateral ground-

glass opacity and third one revealed few patchy opacities in the right perihilar region. Similar result found in a study done by Trippela G et al. where chest X-rays of 6 neonates were consistent with pneumonia and most had normal laboratory findings only 2 patients had thrombocytopenia and one had leukocytosis.<sup>10</sup> In the study of Duran P et al. Only 4 had opacity in the x ray chest among 13 positive neonates and blood test was almost normal.<sup>10</sup> In one study in Wuhan, China, it was found that 3 cases had pneumonia clinically and radiologically.<sup>13</sup> Chest radiography of a 3 weeks old neonate in USA showed bilateral linear opacities and consolidation in the right upper lobe with elevated inflammatory marker.<sup>12</sup>

In this study the associated diagnosis with COVI-19 cases were mostly perinatal asphyxia, septicemia and pneumonia and some surgical conditions. From this study we could not confirm that the clinical features like convulsion, reluctant to feed, respiratory difficulty, lethargy were due to SARS-CoV-2. Most of the cases were associated with one or two diseases along with COVID-19 and all those clinical features may also present in associated diseases. Therefore, it could not be said that those clinical features were definitely due to SARS-CoV-2 virus. Moreover, in our study it was not differentiated whether those presenting clinical features were caused by COVID-19 or not.

Regarding outcome of this study we found that among 47 positive cases 23 patients were discharged after improvement, 14 patients referred to COVID specialized hospital, 2 cases went as LAMA and 8 patients died at our hospital. Limitation of the study was lack of contact tracing as all the cases were out born.

## Conclusion

In this study the incidence of COVID-19 in newborn was 0.85% among hospitalized newborn. The common clinical features were respiratory difficulty, convulsion, fever and reluctant to feed. It could not be differentiated whether these clinical features were due to COVID-19 or associated diseases.

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