

**PREVALENCE AND CLINICAL PROFILE OF COVID-19 IN CHILDREN AT TERTIARY CARE CENTER OF DHAKA: A CROSS-SECTIONAL STUDY****Professor Dr. M. A. Mannan<sup>\*1</sup>, Dr. Mohammad Abul Khayer<sup>2</sup>, Dr. Tareq Rahman<sup>3</sup>, Dr. Asif Rashed<sup>4</sup>, Dr. Abu Sayeed Chowdhury<sup>5</sup>**<sup>1</sup>Professor, Department of Neonatology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.<sup>2</sup>Assistant Professor, Department of Paediatrics, Mugda Medical College and Hospital Dhaka, Bangladesh.<sup>3</sup>Neonatologist, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.<sup>4</sup>Assistant Professor, Department of Microbiology, Mugda Medical College and Hospital Dhaka, Bangladesh.<sup>5</sup>Consultant, Department of Paediatrics, Mugda Medical College hospital, Dhaka, Bangladesh.**\*Corresponding Author: Professor Dr. M. A. Mannan**

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**ABSTRACT**

**Background:** All over the world, fewer cases of COVID-19 in children have been reported than in adults. Most cases in children are mild, and treatment consists of supportive care. Due to geographical, socioeconomical, nutritional and immunological dissimilarity, and inadequacy of health care facility, there would be variation in clinical profile and severity of the affected children with outcome across the globe. There is scarcity of information whether children are at high risk of infection and severity of COVID-19 with outcome during this period.

**Objective:** This study aimed to see the clinical profile of children with COVID-19. **Methodology:** This was a cross sectional study which was conducted at Mugda Medical College Hospital, Dhaka, Bangladesh from March 2021 to June 2021. **Results:** A total of 4141 patients RT PCR were tested for COVID 19 diagnosis, out of them COVID-19 children were 21 which was 4.06% of total RT PCR COVID 19 positive (total number -517). and 8.54% of total tested children (total number -246). There was no tested positive COVID-19 in neonatal and infantile age group, there was only 1 (4.76%) children between 1 and 5 years of age and there were 20 (95.24%) children between 5 and 18 years of age tested positive for COVID-19. Among tested positive children 2 (9.5%) were from outside of Dhaka and 19 (90.5%) were from inside Dhaka. Fever was the most common symptom among all age group. Only 1 (4.76%) children needed hospitalization but no patient needed ICU care. All the patients were recovered.

**Conclusion:** In this study 4.06% children were affected with COVID-19 and all they are mild case. Most of them were above 5 years of age and infected from family members. Fever was the most common symptoms. All the patients of child age were recovered.

**KEYWORDS:** COVID-19, Children, respiratory.**INTRODUCTION**

In December 2019, a previously unknown type of pneumonia broke out in Wuhan, China, which was later confirmed to be caused by a novel type of beta coronavirus, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). In February 2020, the World Health Organization (WHO) officially named the disease as "Coronavirus Disease 2019 (COVID-19)".<sup>[1]</sup> Since the occurrence of COVID-19 case, the disease is spreading rapidly across the world. Now it is a pandemic and global health concern. In March 2020, the virus was reported as having spread to Bangladesh. The country's epidemiology institute, Institute of Epidemiology, Disease Control and Research (IEDCR), announced the first three identified cases on 8 March 2020.<sup>[2]</sup>

Research has proven that people of all ages are susceptible to SARS-CoV-2. Wu J et al., found the mean

age of COVID-19 patients was 47 years, with 55% of the patients being between 15 and 49 years old. Only 9% of the patients were under 15 years old.<sup>[3]</sup> As children's respiratory structural characteristics and immune response system differ essentially from those in adult, the diagnostic criteria and management according to recommendations targeting adults may not be appropriate for children.<sup>[4]</sup>

SARS-CoV-2 less commonly affect children and less severe disease compared with adults and are associated with lower fatality. Evidence suggests children are as likely as adults to become infected with SARS-CoV-2 but are less likely to be symptomatic.<sup>[5]</sup>

Published reports from different countries have mostly shown that pediatric patients represent a marginal proportion of COVID-19 cases, representing less than

2% of the reported ones. This is concordant to previous epidemic out-breaks of SARS-CoV and MERS-CoV in 2002 and 2012, respectively.<sup>[6]</sup>

Therefore, this study aimed to identify the clinical, lab profile and outcome of children with COVID-19.

## METHODOLOGY

This descriptive cross-sectional study was done at Mugda Medical College Hospital from April 2021 to August 2021. Data were collected from patient's medical record with a preform datasheet by details history, demographic profile, and clinical features. Diagnosis for COVID-19 was confirmed by RT-PCR for COVID-19.

Sample swab was take first from the throat and then from the nasopharynx. Single swab was placed in one viral transport media tube and sent to lab for molecular testing.

## Data presentation and Analysis

Data are presented by mean±standard deviation when the data are normally distributed; Otherwise, median (25th percentile–75th percentile) are used to present. Categorical variables are expressed as number and percentage. Data were calculated manually.

## RESULTS

During the study period, total 4141 patients RT PCR were tested for Covid 19 diagnosis. Out of them total children tested were 246 (5.94% of total test) (Table-1). Total RT PCR positive Covid 19 Children were 21 which is 4.06% of total RT PCR covid 19 positive and 8.54% of total tested children (Table-1).

According to age group, 0–28 days 1 (0.41% of total children test) patients was tested for RT PCR COVID-19 and it was test negative; 28 days to 1 year 6 (2.44%) tests were done and no one was positive; 1 year to 5 years 24

(9.76%) were tested and 1(4.76% of test positive children) was positive and 5 to 18 years 215 (87.40%) tests were conducted of which 20 (95.24%) were test positive COVID-19 (Table-2).

Among the RT PCR positive COVID-19 children, 1 to 5 years 1 (4.76%) was female; 5 to 18 years 9 (42.85%) were male and 11 (52.38%) were female; mean age was for 1 years to 3 years age group 3 years and for 5 to 18 years age group 13.8 years; only 1(4.76%) patient needed hospitalization for respiratory distress and was discharged from hospital after 2 days (Table-3). Among them 2 (9.5%) patients were came from outside Dhaka and 19 (90.5%) were from inside Dhaka (Table-3). Of these, 2 (9.5%) patients have asthma and most of them 11 (52.38%) were affected from household members (Table-4).

Clinical presentation of Covid 19 patient were between 1 to 5 years of age were fever 1 (100%), Cough 1 (100%), respiratory distress 1 (100%) and rash 1 (100%). Between 5 years to 18 years of age clinical presentation were fever 15 (75%), cough 12 (60%), respiratory distress 5 (25%), weakness 7 (35%), diarrhea 3 (15%), bodyache/ headache 6(30%) and others 7(35%) (Table 5).

Regarding treatment, between 1 to 5 years 1 patient was RTPCR positive and she was treated with antibiotic, fexofenadin and paracetamol; between 5 years to 18 years age group, out of 20 patient 17 (85%) was treated with antibiotic, montelukast, fexofenadine and paracetamol and 3 (15%) treated without antibiotic (Table 6). No patient were treated with antiviral drugs for covid 19 (Table 6). Out of them only 1 (4.76%) patient was admitted to hospital and no patient was needed ICU care. All the patient were recovered (table 7).

**Table 1: Incidence of COVID-19 in children.**

Parameter	Total test, n (%)	Test positive, n (%)
Both children and adult	4141	517 (12.48%)
Children	246	21 (8.54%)
Percentage (%)	5.94	4.06

**Table 2: Incidence of RT PCR positive children according to age group.**

Parameter	Total RT PCR test n=246	Total test positive n=21	Percentage
0–28 days	1	0	0
28 days to 1 year	6	0	0
1 year to 5 years	24	1	4.76
5 years to 18 years	215	20	95.24

Table 3: Demographic distribution of children of covid 19 positive (Total no. 21)

Variables	0-28 days n (%)	28 days to 1 year, n(%)	1 year to 5 years, n(%)	5 years to 18 years,n(%)
Sex				
Male	-	-	0	9 (42.86%)
Female			1 (4.76%)	11 (52.38%)
Age in years (mean±SD)	-	-	3	13.8±4
Resident				
Inside Dhaka	-	-	0	2(9.5%)
outside Dhaka			1(4.8%)	18(85.7%)
Hospital admission				
Yes	-	-	0	1(4.76%)
No			1(4.76%)	19(90.48%)
Hospital stays in days, (mean±SD)	-	-		2

Table 4: Distribution of comorbidity and probable source of infection among study group (total no. 21)

Variables	0—28days n (%)	28 days –1 year n (%)	1 –5 years n(%)	5 –18 years n(%)
Comorbidity				
Asthma				2 (9.5%)
Diabetes				0
Obesity	-	-		0
Cancer				0
Immunosuppressive condition				0
Source of infection				
Household members			1(4.76%) 0	3 (14.14.29%) 11(52.38%)
Non-Household members			0	6(28.57%)

Table 5: Distribution of symptoms among the study group (Describe it in result section)

Variables	0-28 days, n (%)	28 days to 1 year, n (%)	1 year to 5 years, n (%)	5 years to 18 years, n (%)
Fever			1 (100%)	15(75%)
Cough			1 (100%)	12(60%)
Respiratory Distress			1(100%)	5 (25%)
Weakness				7(35%)
Rash			1(100%)	
Diarrhea				3 (15%)
Bodyache/headche				6(30%)
Others				7(35%)

Table 6: Treatment Pattern of COVID-19 Children.

Variables	0-28 days, n (%)	28 days to 1 year, n (%)	1 year to 5 years, n (%)	5 years to 18 years, n (%)
Antibiotic				
Yes			1(100%)	17 (85%)
No			0	3(15%)
Antihistamine				
Yes			1(100%)	20(100%)
No			0	0
Thromboprophylaxis				
Yes			0	0
No			1(100%)	20 (100%)
Drug for COVID-19				
Yes			0	0

No			0	0
Oxygen inhalation				
Yes			0	0
No			0	0
ICU care				
Yes			0	0
No			0	0

Table 7: Outcomes of covid 19 patients (total no. 21)

Variables	0-28 days, n (%)	28 days to 1 year, n (%)	1 year to 5 years, n (%)	5 years to 18 years, n (%)
Recovered				
Yes			1 (100%)	20(100%)
No			0	0
Death				
Yes			0	0
No			1(100%)	20(100%)

## DISCUSSIONS

During the study period, total 4141 patients (both adult and children) RT PCR were tested for Covid 19 and 517 (12.48%) patients were RT PCR positive Covid 19. Out of them total children tested were 246 (5.94% of total test) of which only 4.06% (21) of total RT PCR covid 19 positive and 8.54% of total tested children were Covid 19 (Table-1). According to age group, below 1 year none was covid 19 positive; between 1 year to 5 years, 4.76% case were positive and 5 to 18 years, 95.24% cases were positive Covid 19 (Table-2). Mean age of covid 19 children were 13.8 years (Table 3). This study showed that children are less affected (4.06% of total) by covid 19 compared with adult and major affected children are above 5 years of age. Published reports from different countries have mostly shown that pediatric patients represent a marginal proportion of Covid-19 cases, representing less than 2% of the reported cases which is similar to this study.<sup>[6-9]</sup> The American Academy of Pediatrics and the Children's Hospital Association reported that children are less affected than adults 13.8% of total cumulated covid 19 cases in United States.<sup>[10]</sup> Another study from Italy showed that children younger than 18 years of age were only 1% of the total number of COVID- 19 patients.<sup>[11]</sup>

Sayed Anwar et al reported that most cases in children were between 11-- 15 years of age and in our study children above 5 years are 95.24%.<sup>[12]</sup> There are other studies which also reported that children under 10 years are less vulnerable to develop covid 19.<sup>[13-16]</sup> Most probable cause that children are routinely vaccinated against vaccine preventable diseases, including tuberculosis, diphtheria, pertussis, measles, rubella, mumps and hepatitis B. These microorganisms might have the same antigenic structure like the spike (S) protein and nucleocapsid (N) protein of SARS-CoV-2. The spike (S) protein plays a key role in the binding of viruses to a specific receptor on the epithelial cells of the respiratory system and are also the main immunogenic proteins of SARS-CoV-2 that induce the host immune system.<sup>[13,14]</sup> These neutralizing antibodies produced

against the foregoing vaccine preventable microbes might cross-react with the antigenic epitopes of the spike (S) and nucleocapsid (N) proteins and prevent COVID-19 in children. The memory T -cells which are large number in children may also be involved in the protection of children against covid 19.<sup>[13,15,16]</sup>

Most of the children (90.5%) were from inside Dhaka (Table-3) and 71.3% were affected from their parents (Table 4). In this study, children rarely have comorbidities (only 9.5% had asthma) (Table 4) which correlates with many other studies.<sup>[10,17]</sup> Rehman S et al (2020) and Felstein et al (2020) reported that the main risk factors for COVID-19 were close contact with an infected family member and a history of residence in an endemic area which is similar to this study.<sup>[10,17]</sup>

Clinical presentation of COVID-19 patients were between 1 to 5 years of age were fever (100%), Cough (100%), respiratory distress (100%) and rash (100%). Between 5 years to 18 years of age clinical presentation were fever (75%), cough (60%), respiratory distress (25%), weakness (35%), diarrhea (15%), bodyache/headache (30%) and others (35%) (Table 5). In this study, no patient was suffering from severe covid 19 illness.

Sayed Anwar et al found that 89.1% of patients had a fever, 80.8% had a cough, 23.1% had diarrhea, and 70.8% had myalgia which is almost similar to this results.<sup>[12]</sup>

The most frequent symptoms in children were headache, cough, fever, myalgia, sore throat, shortness of breath, and diarrhea which is also similar to this study.<sup>[18]</sup> Other less commonly reported symptoms included rhinorrhea, nausea/vomiting, abdominal pain, and anosmia.<sup>[18]</sup>

Children with severe COVID-19 may develop respiratory failure, myocarditis, shock, acute renal failure, coagulopathy, and multi-organ system failure but in this study no patient develop such complication<sup>[19]</sup>

because in this study patient were mild and moderate covid-19.

In this study, patients were treated with antibiotic, montelukast, fexofenadine and paracetamol and 15% patients were treated without antibiotic (Table 6). No patient was treated with antiviral drugs for covid 19 (Table 6). Out of them only 4.76% patient was admitted to hospital and no patient was needed ICU care. Several studies showed that severe illness due to COVID-19 is rare among children which are similar to this study results.<sup>[6-10,17]</sup>

Children are less likely to develop severe disease and rarely needed hospitalization (4.76%) (Table-3). In this study, all the patients were recovered from the illness (table 7). There are several studies reported that, most pediatric COVID-19 patients have a good prognosis.<sup>[17,19-21]</sup> Recently, a large amount of data from the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19) suggested a fatality rate of 0.2-0.4% in 10-40 years of age and no deaths rates in  $\leq 9$  years of age.<sup>[22,23]</sup>

The American Academy of Pediatrics and the Children's Hospital Association reported Covid-19-associated hospitalization and death is uncommon in children which results were similar to our results.<sup>[10]</sup> Another study from Italy showed that children younger than 18 years of age only 11% were hospitalized, and none died which is also correlates to this study.<sup>[11]</sup>

## CONCLUSION

In this study 4.06% children were affected with COVID-19 and all they are mild case. Most of them were above 5 years of age and infected from family members. Fever was the most common symptoms.

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