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Clinico-demographic Profile of Coronavirus Infection among Bangladeshi Children: A Tertiary Care Hospital Study

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Abstract

Background: Variation and atypical presentation of COVID-19 in Bangladeshi children has been noticed. **Objective:** The purpose of the present study was to see the clinical and demographic features for easy and early identification of coronavirus infection. **Methodology**: This descriptive cross-sectional study was done at Dr. MR Khan Shishu Hospital & ICH, Dhaka, Bangladesh from April 2020 to August 2020. The suspected case of coronavirus infection was advised RT-PCR and symptomatic home treatment was given. Hospitalization was done in severe cases. Then diagnosis was made by clinical symptoms plus investigations and appropriate treatment was given. Then RT-PCR was done among them in suspected cases. Other investigations were done accordingly. **Results:** Among the 236 cases RT-PCR positive was found 71(30.08%) cases. The male-female ratio was 1.7:1. Mostly was 1 year to 2 years (21.13%) and 5 years to 10 years (21.13%). About twenty percent was asymptomatic, 80.28% was symptomatic, co-infections was 29.58%, and co-morbidities was 8.45%. The duration of RT-PCR was positive up to two, four, six, and more than six weeks 49.30%, 30.99%, 16.90%, and 2.82% respectively. Fever (80.28%), cough (45.07%), sore throat (33.80%), runny nose (29.58%), anorexia (28.17%), convulsion (25.35%), respiratory distress & acute diarrhea (15.50%), weakness (14.08%), paralytic ileus, rash and acute abdomen (4.23%). **Conclusion:** COVID-19 in Bangladeshi children are found with a variety of clinical presentations; unlike that of the adult. [*Bangladesh Journal of Infectious Diseases, October 2020;7(suppl_2):S16-S21*]

Keywords: Clinical; demographic profile; COVID-19; children; Bangladesh

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Introduction

Coronaviruses (CoVs) are enveloped, single-stranded, zoonotic, RNA viruses of a large family. The novel CoVs severe acute respiratory syndrome coronavirus (SARS-CoV) emerged in 2002. The 2019 novel coronavirus (SARS-CoV-2) is currently causing a severe outbreak of disease (called COVID-19) in China and multiple other countries including Bangladesh. Now it is a pandemic and global health concern. In humans, CoVs mostly cause respiratory and gastrointestinal symptoms. Clinical manifestations range from a common cold to severe diseases such as bronchiolitis, pneumonia, ARDS, inflammatory syndrome, multi-organ failure, and even death. SARS-CoV and 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. The majority of children infected by novel CoVs have documented household contact. In contrast, adults more often have nosocomial exposure[1].

According to the National Guidelines on Clinical Management of Coronavirus Disease 2019 (COVID-19) in Bangladesh shows corona symptoms are Mild illness (Influenza-like illness-ILI), Pneumonia, Severe pneumonia, Acute respiratory distress syndrome, Sepsis, Septic shock[2]. Common symptoms of COVID-19 in children are cough and fever. It is important to note that these symptoms may not always be present; thus, a high index of suspicion for SARS-CoV-2 infection is required in children[3]. Most cases in children are mild, and treatment consists of supportive care. No drugs or biologics have been approved by the USA Food and Drug Administration (FDA) for the prevention or treatment of COVID-19, and no vaccine is currently available[4].

UK study says the majority of patients under 18 years old experienced a mild disease and less than 1% of them died[5]. A study of European children with COVID-19 suggests deaths are extremely rare. Four of the 582 children studied died, two of whom had known underlying health conditions. Children's symptoms were generally mild. Some who tested positive had no symptoms[6].

Clinical manifestations of children with COVID-19 differ widely from adult cases. Fever and respiratory symptoms should not be considered a hallmark of COVID-19 in children[7]. So this study was conducted to see the clinical and demographic features for easy and early identification of coronavirus infection to minimize morbidity, mortality & community transmission.

Methodology

This descriptive cross-sectional study was done at Dr. M R Khan Shishu Hospital & ICH, Mirpur-2, Dhaka, Bangladesh from April 2020 to August 2020. Patients were attending the outpatient department and inpatients department were taken for this study. Patients without symptoms with a definitive history of contact with COVID-19 patients, with COVID-19 symptoms, with symptoms that could not be correlated with other illnesses, were included in this study. The suspected case of coronavirus infection was advised RT-PCR for COVID-19 and symptomatic treatment was given in the outpatient department. Hospitalization was done in severe cases. After hospitalization diagnosis was made by clinical symptoms criteria plus investigations accordingly and appropriate treatment was given. During the following of these cases; our suspicion arouses that they are might be COVID-19 cases or associated with other infections. Then nasopharyngeal and oropharyngeal swab was taken and sent for RT-PCR for COVID-19. Other investigations are done accordingly. RT-PCR positive cases were our sample size (N). Data were collected with a preform datasheet by details history, demographic profile, and clinical features.

Results

Among the suspected tested samples of 236 children RT-PCR positive for COVID-19 was found in 71(30.1%) (Table 1).

Table 1: Distribution of RT-PCR Positive Cases for COVID-19.

RT-PCR for COVID-19	Frequency	Percent
Positive	71	30.1
Negative	165	69.9
Total	**236**	**100.0**

Among the 71 cases neonate 1(1.40%), more than 28 days to less than 3 months 2 (2.81%), more than or equal to 3 months to less than 6 months 6(8.45%), more than or equal to 6 months to less than 1 year 13(18.31%), more than or equal to 1 year to less than 2 years 15(21.13%), more than or equal to 2 years to less than 5 years 10(14.08%), more than or equal to 5 years to less than 10 years 15(21.13%), more than or equal to 10 years to less than or equal to 18 years 9(12.68%) were found (Table 2).

Table 2: Age Distribution of Study Population (n=71)

Age Group	Frequency	Percent
Neonates	1	1.40
>28 days to < 3 months	2	2.81
≥ 3 months to < 6 months	6	8.45
≥ 6 months to < 1 year	13	18.31
≥ 1 year to < 2 years	15	21.13
≥ 2 years to <5 years	10	14.08
≥ 5 years to < 10 years	15	21.13
≥ 10 years to ≤ 18 years	9	12.68
Total	**71**	**100.0**

Among the 71 cases Male was 43(60.56%) and female was 28(39.43%). The male-female ratio was 1.7:1 (Table 3).

Table 3: Gender Distribution of the Study Population (n=71)

Gender	Frequency	Percent
Male	43	60.56
Female	28	39.43
Total	**71**	**100.0**

Positive cases were found mostly within the Dhaka city 56 (78.87%) (Figure I).

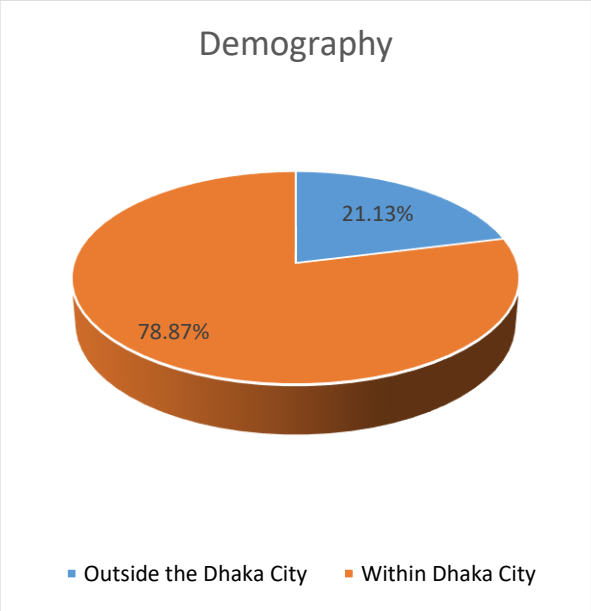

Figure I: showing the categorization of COVID-19 Patients according to the Living zone (n=71)

Among 71 cases, 14 (19.72%) were asymptomatic; symptomatic 57 (80.28%), co-infections 21 (29.58%), Co-morbidities 6(8.45%). Documented home exposed to COVID-19 patient 39(54.93%), IPD treatment received 35(49.30%), OPD treatment received 34(47.89%), ICU Care/ Referred needed 02 (02.80%), Survived 70(98.59%), dead 1(1.4%). Duration of RT-PCR positive ≤ 14 days 35(49.30%), > 14 days to ≤ 28 days 22(30.99%), > 28 days to ≤ 45 days 12(16.90%), > 45 days 2(2.82%) were found (Table 4).

Table 4: Categorization of COVID-19 Patients according to the following Variables (n=71)

Variables	Frequency	Percent
Type of Presentation		
Asymptomatic	14	19.72
Symptomatic	57	80.28
Co-infections	21	29.58
Co-morbidities	6	8.45%
History of exposure		
Documented home exposed to COVID-19 patient	39	54.93
No home exposed to COVID-19 patient	45	45.07
Needful treatment		
IPD treatment	35	49.30
OPD Treatment	34	47.89
ICU Care/ Referred	02	02.80
Outcome		
Survived	70	98.59
Dead	1	1.4
Duration of RT-PCR positive		
≤ 14 days	35	49.30
> 14 days to ≤ 28 days	22	30.99
> 28 days to ≤ 45 days	12	16.90
> 45 days	2	2.82

Fever 57 (80.28%), cough 32 (45.07%), sore throat 24 (33.80%), runny nose 21(29.58%), anorexia 20(28.17%), convulsion 18(25.35%), respiratory distress 11(15.50%), acute diarrhea 11(15.50%), weakness 10(14.08%), Paralytic ileus 3(4.23%), rash 3(4.23%), acute abdomen 3(4.23%), bloody diarrhea 2 (2.82%), anosmia 2(2.82%), jaundice 1(1.41%), conjunctivitis 1(1.41%), arthritis1(1.41%), unconsciousness 1(1.41%) were found (Figure II).

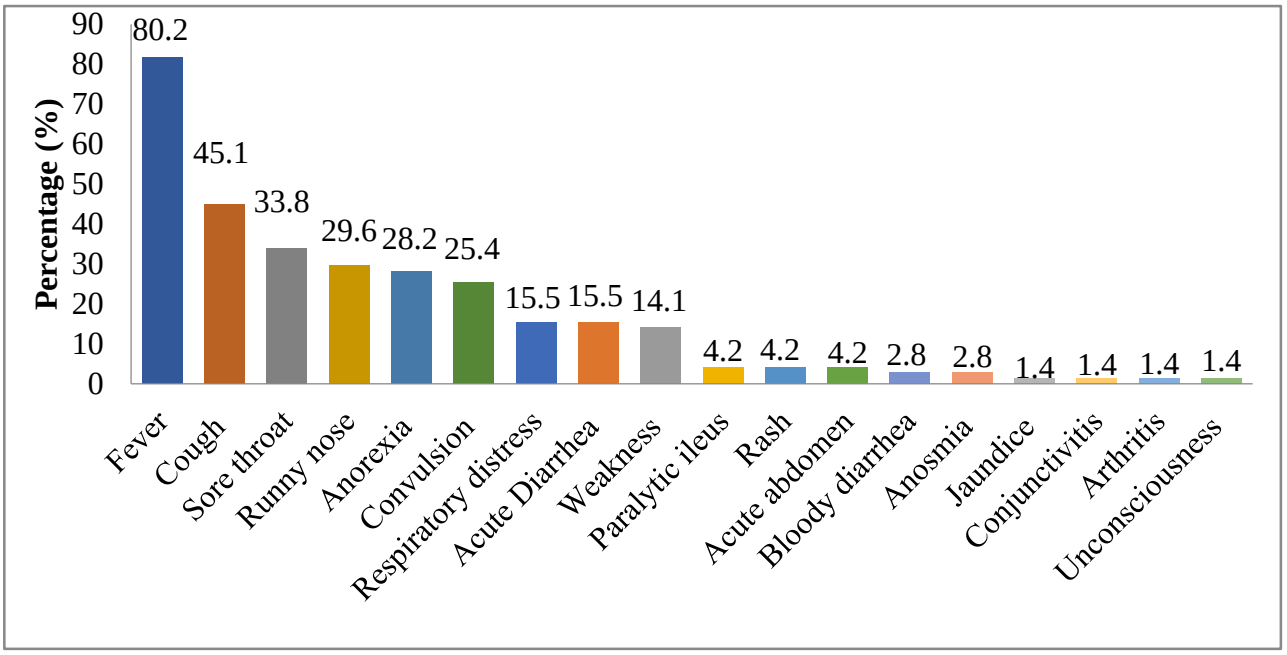

Figure II: Showing different Clinical Features among the Study Population (n=71)

Discussion

RT-PCR positive for COVID-19 was found 71(30.08%) among the suspected tested sample 236. Among the 71 cases neonate one case, 28 days to less than 3 months 2.81%, 3 months to less than 6 months 8.45%, 6 months to less than 1 year 18.31%, 1 year to less than 2 years 21.13%, 2 years to less than 5 years 14.08%, 5 years to less than 10 years 21.13%, 10 years to less than 18 years 12.68% cases were found. China and the United States reported only about 2.4% coronavirus infection among children where age was under 19 years[8,9]. Male was 43(60.56%) and female was 28(39.43%). The male-female ratio was 1.7:1. Positive cases were found mostly within the Dhaka city about 80%.

Among the positive cases 19.72% asymptomatic, symptomatic 80.28% were found. Although reported, the child mostly remains asymptomatic but our study showed symptomatic more as the study was done in a tertiary care hospital. Reports showed COVID-19 in children is gradually increasing. The illnesses were mild (31.3 %) or ordinary (68.8 %), presenting as asymptomatic (50 %)[10].

Another report showed mild clinical signs and symptoms were mild (21.4%) and conventional cases (78.6%).[11] Fifteen percent were asymptomatic, 36.3% were mild, 46.0% were moderate, 2.1% were severe, and 1.2% were found critical in another study[7].

In this study, among the clinical presentation predominant feature fever 80.28%, cough 45.07%, sore throat 33.80%, runny nose 29.58%, anorexia 28.17%, convulsion 25.35%, respiratory distress 15.50%, acute diarrhea 15.50%, weakness 14.08%, paralytic ileus 4.23%, rash 4.23%, acute abdomen 4.23%, bloody diarrhea 2.82%, anosmia 2.82% Jaundice 1.41%, Conjunctivitis 1.41%, arthritis Here, have to mention that there were overlapping of clinical features. In many studies findings like these, fever and cough were the most common symptoms. Afebrile at the onset of the disease nearly half of patients[12]. Fever and/or cough (50 %) were presenting as illness[10]. Clinical manifestations in children were fever (35.7%) and dry cough (21.4%)[11].

Asymptomatic, Acute upper respiratory tract infection, Mild pneumonia, Severe pneumonia Critical cases were found. Clinical symptoms of Fever, Cough, Rhinorrhea/sneezing, Sore throat, Headache/dizziness, Diarrhea, and Dyspnea/tachypnea were noticed in another study[13]. Among the convulsion cases, one case was found as a status epilepticus. Four boys out of five showed neurological symptoms axial hypotonia or drowsiness and moaning sounds, or both. Lumbar punctures were done and the cerebrospinal fluid study was normal[14].

One case was found conjunctivitis associated with some other features as like as Kawasaki disease in our study. Maximum cases in children were asymptomatic, mild, or moderate but having unusual presentations of a Kawasaki disease (KD)-like inflammatory syndrome associated with COVID-19[15]. Surgical cases were found acute abdomen were

3 in number where one found as acute appendicitis and two found as a nonspecific abdominal pain.

A case reported at Dhaka Shishu (Children) Hospital that atypical presentation of COVID-19 as acute abdomen[16]. An 11-year-old boy presented with fever, diarrhea, and a maculopapular rash over both feet and severe abdominal pain with COVID-19 positive without any respiratory symptoms were seen in another case report[17]. A study showed that in three of the five patients, the primary onset disease required an emergency operation included intussusception, acute supportive appendicitis, perforation with local peritonitis, and traumatic subdural hemorrhage with convulsion, two cases were acute gastroenteritis (including one patient with hydronephrosis and a stone in his left kidney)[18].

Typical and main presentations of COVID-19 in adult was fever, cough, respiratory distress, and hypoxia, but the atypical presentation in children is a diagnostic challenge. Three children whose initial presentation was gastrointestinal in whom Covid-19 infection was found, concluding that cases of acute appendicitis, mesenteric adenitis, and flank tenderness[19]. All patients presented with a combination of symptoms including fever, abdominal pain, diarrhea, and vomiting. The working diagnosis was of systemic sepsis based on raised blood inflammatory markers thought to be secondary to suspected appendicitis[20].

All the surgical cases were managed by conservatives in our study. A study has been revealed a milder course of COVID 19 in children with minimal infectivity even when present in association with emergency surgical conditions. This might encourage a gradual restart to mitigate the impact of COVID 19 on children's surgery[21].

Among positive cases, co-infections were found about one third percentage cases in this study. So, co-infection is not very uncommon with COVID-19. Enteric fever, typhus fever, bacterial meningitis, bacterial pneumonia, UTI, hepatitis A, E virus infection, etc. found as co-infections among Bangladeshi children in our study. Many studies showed co-infection with COVID-19[22-27]. Although co-infection pattern depends upon an epidemiological and geographical location.

Co-morbidities were found in about 10% cases where one case was juvenile diabetes mellitus, two cases were bronchial asthma and three cases were congenital heart disease. Nearly Forty patients (83%) had significant preexisting co-morbidities published in another study[28]. A case reported co-infection with comorbidities, a 4-month-old boy with a muscular ventricular septal defect, and atopic dermatitis presented with gastroenteritis and respiratory tract infection with a documented history of home exposure to COVID-19. The initial respiratory pathogen was positive for adenovirus. But on the following day, the COVID-19 PCR was also positive[29].

Documented home exposed to COVID-19 patient 54.93%. Without documented home exposer nosocomial infection might be a great concern. A study found where all cases were of family clusters[11]. IPD treatment received 35 cases, OPD treatment received 34 cases, ICU Care/ referred only 2 cases where 70 cases survived and dead one case. In a study, about one in 10 needed intensive care[6]. Less than 1% died among the children found in a UK study[5]. Duration of RT-PCR positive up to14 days 49.30%, up to 28 days 30.99%, up to 45 days 16.90%, more than 45 days 2.82% were found.

There are some limitation of this study. It is a single-center tertiary level hospital study. A community-based study is needed for a more conclusive result.

Conclusion

In conclusion, COVID-19 in Bangladeshi children are found with a variety of clinical presentations; unlike that of adults. Asymptomatic to the symptomatic presentation is found where clinical features like fever, cough, sore throat, runny nose, anorexia, convulsion, respiratory distress, acute diarrhea, weakness, paralytic ileus, rash, acute abdomen, bloody diarrhea & anosmia, jaundice, conjunctivitis, arthritis and unconsciousness, and positive cases are found mostly within the Dhaka city.

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