

# COVID-19 in Children a Descriptive Study at the Security Forces Hospital (SFH)-AL Riyadh-Saudi Arabia

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## Authors' contributions

*This work was carried out in collaboration among all authors. Author EAB designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AA and WHAA managed the data collection of the study. Author FMA managed the literature searches and Author FAA managed the discussion. All authors read and approved the final manuscript.*

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## ABSTRACT

Coronaviruses (CoV) are RNA respiratory viruses that present with a wide range of symptomatology which range from common cold to severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). In December 2019 a new strain was discovered in China named Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2), named "COVID-19" by World Health Organization (WHO).

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**Objective:** To study the prevalence and clinical presentation of COVID-19 among children attended pediatrics emergency department.

**Result:** from 1st March to 30<sup>th</sup> of June 2020. During the study period, a total of 223 patients with age between 16 days and 12 years were diagnosed as positive COVID-19. Male were 52%. Fever was found in 39.9%, cough in 14.3%, and diarrhea in 3.6%.

**Conclusion:** our study gives a clue to the clinical presentation of COVID-19 in pediatric populations.

*Keywords: COVID-19; SARS-CoV; children; Saudi Arabia.*

## 1. INTRODUCTION

Coronaviruses (CoV) are RNA viruses that causes mild common cold to sever diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). The new strain of coronavirus identified in December 2019, in Wuhan city, Hubei province of China, has been named as Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses (ICTV). Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2) disease was named "COVID-19" by World Health Organization (WHO). WHO reported In January, 2021, a 93,449,996 confirmed cases of COVID-19 worldwide [1].

In Saudi Arabia, the first reported case of COVID-19 was on March 2, 2020, involving a Saudi national returning from Iran via Bahrain. The first reported death of a child in Saudi Arabia due to COVID-19 related complications was on April 25, 2020 [2].

The main symptoms of human coronaviruses (HCoVs) in children are common cold symptoms such as fever [3,4] rhinitis [3,4] otitis media [3] pharyngitis [3,4] laryngitis [3] and headache [3,5,6] but also bronchitis [3,4] bronchiolitis [3,4], wheezing [7,4] pneumonia [3,6], and 57% with gastrointestinal symptoms.

In children, HCoV-NL63 has been associated with conjunctivitis [8] croup [4,9,10] asthma exacerbations [4,11] febrile seizures [10] and HCoV-HKU1 with febrile seizures [12]. Rare cases of neurologic diseases have also been described, for example- the detection of HCoVs in cerebrospinal fluid in a child presenting with acute disseminated encephalomyelitis or in cerebrospinal fluid of adults with multiple sclerosis [13,14]. A suspected association between HCoVs and Kawasaki disease was raised but could not be confirmed [15,16].

In Asia and Europe COVID 19 showed mild clinical progression where as in the United States it showed sever clinical progression [17].

The diagnosis of infections with HCoVs is by real-time polymerase chain reaction (RT-PCR) test on upper or lower respiratory tract secretions [3,18]. For SARS-CoV, MERS-CoV and SARS-CoV-2, higher viral loads have been detected in samples from the lower respiratory tract compared with the upper respiratory tract [16].

Treatment of COVID 19 in pediatrics is mainly supportive including sufficient fluid and calorie intake, and additional oxygen supplementation should be used in the treatment of children infected with HCoVs. Treatment is also important to prevent ARDS, organ failure and secondary nosocomial infections. Broad-spectrum antibiotics such as second or third generation cephalosporins are used if there is a suspicion of co-bacterial infection [2].

Many other drugs are approved to be used in the treatment of COVID-19 in many countries [2].

**CURB-65 severity score:** Score 1 point for each of following features that are present: Confusion (mental test score  $\leq$  8 new disorientation in person, place or time) .

BUN > 20 mg/dL

Respiratory rate  $\geq$ 30 breaths/min

Blood pressure (systolic<90 mm Hg, or diastolic  $\leq$ 60 mm Hg)

Age  $\geq$ 65 years

## 2. METHODOLOGY

Data from the hospital medical record system of confirmed COVID-19 infection from 1<sup>st</sup> March until 30<sup>th</sup> July 2020, were analyzed.

Demographic (Age and Sex), clinical symptoms at presentation, history of contact with COVID-19 person and place of isolation were documented.

Study included:

- 1- Both sex with age from day 1 to 12 years.
- 2-Real test –polymerase chain reaction positive for COVID-19.
- 3-Those who attended Security Forces Hospital Pediatrics Emergency Department.

Study excluded:

- 1- Those more than 12 years old
- 2-Real test-polymerase chain reaction negative for COVID-19.

Data analyzed by Statistical Analysis Software (SPSS) version 20. Figures designed by Word 2016.

### 3. RESULTS

The study was done in pediatric emergency department (ED)-Security Forces Hospital-AL Riyadh from 1<sup>st</sup> March to 30<sup>th</sup> June 2020. From the total of 648 pediatric patients screened 223 patients were diagnosed as positive COVID-19.

Males were 116(52%) patients and females were 107(48%) patients. Patients age ranged from 16 days to 12 years old with a mean age of 5.12 years (SD 3.7 years).

Fig. 1. showed those of age 5 years old or more were 107(48%) patient, between 1year and less than 5 years old were 75(33.6%) patient, between 1 month and less than 1 year old were 33(14.8%) patients and less the 1 month old were 8(3.6%) patients.

Fig. 2. showed clinical presentation: fever in 89(39.9%), cough in 32(14.3%), fever and cough in 49(22%), diarrhea in 8(3.6%), thirty eight (17%) were asymptomatic and other symptoms(e.g abdominal pain, sore throat, burning micturition, and ear pain) occurred in 7(3.1%) patients.

The result showed those who had contact with a person with COVID-19 were 160(71.7%) patients and 63(28.3%) patient had no contact with COVID-19 persons.

Patients who went to home isolation were 215(96.4%) patient and 8(3.6%) patients were admitted to hospital.

### 4. DISCUSSION

Since 1<sup>st</sup> March to 30<sup>th</sup> of June 2020 we screened 648 pediatric patients, 223 patients were found to be COVID-19 positive.

In our study 48% patients were of age 5 years or more, 33.6% patients were 1 year and less than 5 years old, 14.8% patients were 1 month to less than 1 year old, and 3.8% patient were less than 1 month old , their mean age was 5.12± 3.7 years old, in Madrid-Spain the median age was 3 years old [19]. In Wenjun Du et al. [20] study in China the median age was 6.2 years old and 6.7 years old in Li Q Guan et al. [21] study in Wuhan-China.

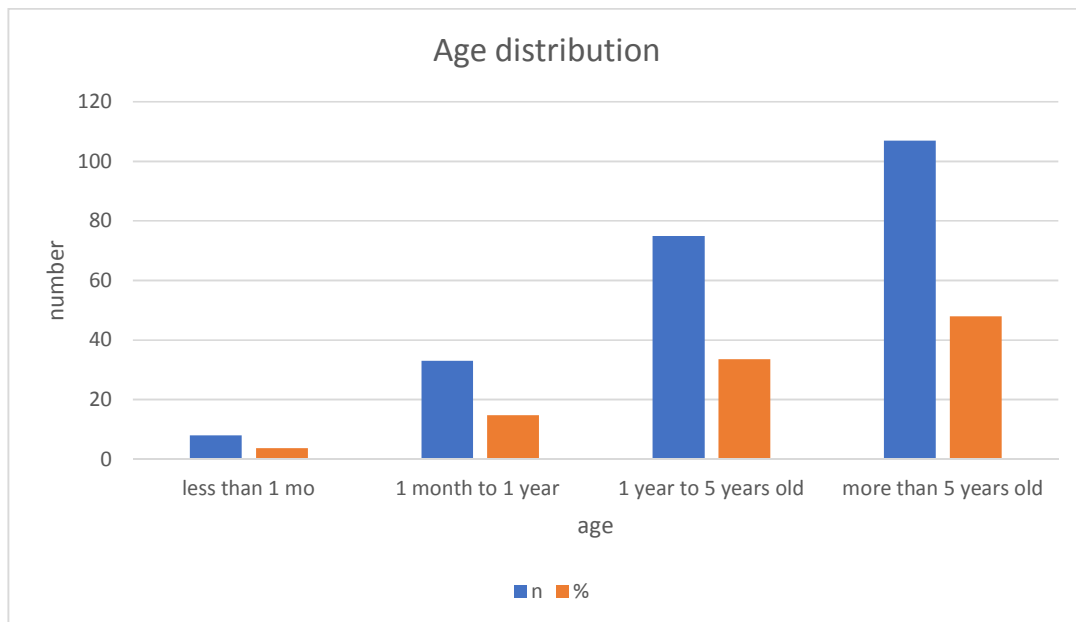


Fig. 1. Age distribution

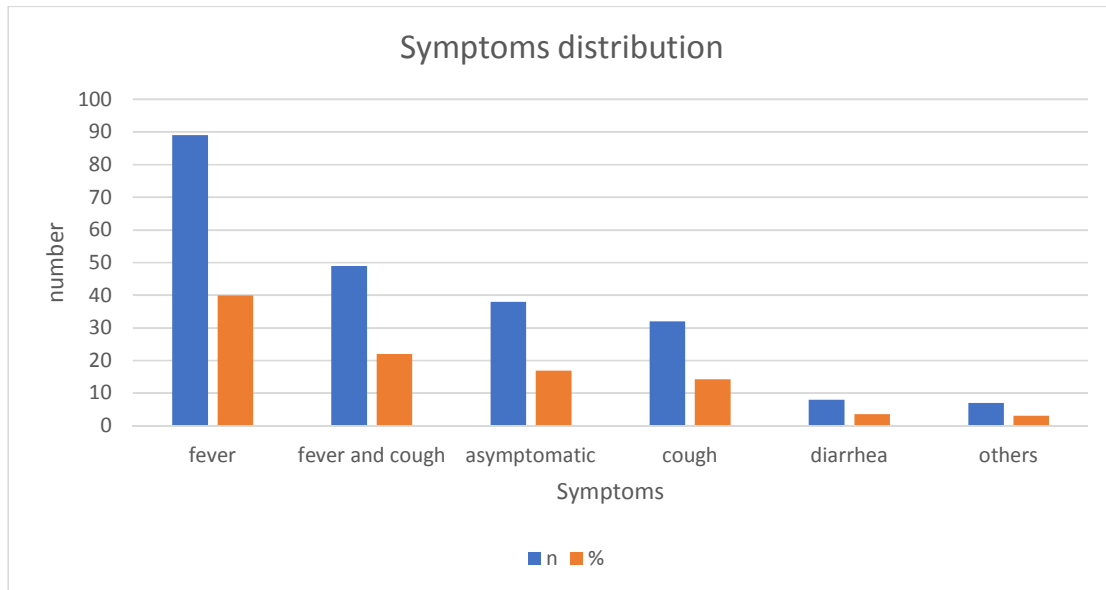
**Table 1. Suspected COVID-19 case is defined as COVID-19 case definition as per Saudi Arabia Ministry of Health Protocol [2]**

<b>Clinical presentation</b>	<b>Epidemiological link</b>
1-Patient with acute respiratory illness (sudden onset of at least one of the following: fever or recent history of fever, cough or shortness of breath) AND in the 14 days prior to symptom onset	Had a history of travel abroad or Travel to an identified high-risk area in the kingdom or A close physical contact prior to symptom onset with a confirmed COVID-19 case* or Working in or attended a healthcare facility where patients with confirmed COVID-19 are admitted.
2-Adult patient with severe acute respiratory illness (ICU admission, ARDS <sup>b</sup> or CURB-65score <sup>c</sup> ≥ 3 points) AND all the following conditions fulfilled <ul style="list-style-type: none"> <li>- Testing for influenza and MERS-CoV are negative.</li> <li>- Clinical assessment indicating that the patient is not improving and has no clear underlying causes</li> </ul>	Not required

<sup>a</sup>As determined and announced by the Ministry of Interior or Ministry of Health.

<sup>b</sup>ARDS: Acute respiratory distress syndrome (based on clinical or radiological evidence)

<sup>c</sup>CURB-65 = Confusion, Urea nitrogen, Respiratory rate, Blood pressure, 65 years of age and older



**Fig. 2. Symptoms distribution**

In our study males represented 52% where in Madrid-Spain [19] males were 44%, also in a series of studies done by *Petra Zimmermann, and Nigel Curtis* [22] in China showed males were 55% which is almost near to our study

In our study population, fever as presenting symptoms was in 39.9% where in three studies in China [23,24,25] fever was found in 11%, 32% and 44% of their patients with COVID-19. In adult fever and cough were found in 78% and 57% respectively [26].

Cough was found in 14.3% of our study population which was almost similar to three studies done in China [23,24,25] in which cough was found in 4%, 19% and 22% of those with COVID-19.

We found diarrhea as a presenting symptom for COVID-19 in 3.6%, where as in two different studies in China [23,24] it was in 6% and 9% of their patients.

In Madrid-Spain fever was found in 27%, viral like pneumonia in 15% and gastrointestinal symptoms in 5% of their COVID-19 patients [19].

A symptomatic patients in our study were 17%, in a systemic review study by Jaffar A. Al-Tawfiq et al. [27] in Jeddah outbreak with Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in 2012 asymptomatic infection was found in 25%, and in pediatrics 82% were asymptomatic.

In Germany\_ [28] transmission of the disease from asymptomatic patient was reported.

We had 96.4% patients had contact with COVID-19 patients' and colleagues [29] had 28% of their studied patients were asymptomatic and had contact with infected adult.

Although transmission rate in COVID-19 is high but studies showed symptoms are less severe than SARS/Middle East Respiratory Syndrome (MERS) [30].

## 5. CONCLUSION

The finding from this study suggests a guide to pediatricians and infection control teams about the clinical presentation of COVID-19 in pediatrics population.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

Ethical approval was taken from the hospital research department.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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