Children with asymptomatic coronavirus disease-19 (COVID-19): Insights from 2-to 15-year-old cases

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Case Report

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Abstract

Summary of clinical characteristics of 25 confirmed cases of COVID-19 in children aged between 2 and 15 years, with at least one infected member in their family, are reported and discussed herein. Eighteen patients are asymptomatic, and seven have mild complications without requiring mechanical ventilation or intense unit care (ICU). Results suggested that children with infected family members are very likely to be asymptotically infected.

Background

An outbreak of coronavirus disease-19 (COVID-19) infection began in December 2019 in Wuhan, the capital of central China's Hubei province [1, 2]. Since then, COVID-19 has become a public health threat to people all over the world. The lower airway is the primary target of the infection for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In patients with severe COVID-19, pneumonia is always present [3, 4]. The most common complaints of patients consist of fever (98%), cough (76%), dyspnea (55%), myalgia, and fatigue (44%) [5-10]. Reports show that COVID-19 seems to be uncommon or usually with mild symptoms in children [11-14]. At the same time, it is also reported that it occurs in children, causing moderate-to-severe respiratory illness [15, 16]. Children do not count for a large proportion of COVID-19 infections. Children who suffer from acute myocardial injury and SARS-CoV-2 might present with another viral agent coinfection [17-20]. The clinical manifestations of pericarditis and myocarditis might range from mild nonspecific symptoms to chest pain and cardiogenic shock [21-23]. Myocarditis in children might present with flu-like symptoms, shortness of breath, tachycardia, dyspnea, nausea, decreased appetite, poor feeding, and tachypnea in infants [24-26]. Previous studies are performed within small groups of children, thus needs further investigation.

Patients And Methods

The total number of confirmed cases is 412 in Dijon until June 15, 2020, with a total number of 25 children aged between 2 and 15 years. In this study, demographics, epidemiological history, and symptoms of the 25 children are mentioned and discussed.

Results

Polymerase-chain-reaction (PCR) test and computed tomography (CT) were performed on the 25 children with at least one infected member in their family between March 20 and June 15, 2020, in Dijon. Table 1 shows the Summary of the clinical characteristics of the 25 patients. The median age of the patients was 8 (range 2 to 15). Although there were both male and female children in 23 of the 25 families, 17 of the patients were male. Both PCR and CT results were positive for all 25 patients. The CT test showed patchy ground-glass opacities (GGO) for all of them. Common clinical characteristics included fever (in two patients), cough (in five) sore throat (in one), and the other 18 patients were asymptomatic. None of the

patients had severe complications, and they did not receive mechanical ventilation or intense unit care (ICU). Finally, all patients were discharged home without requiring hospitalization.

Table 1. Summary of the clinical characteristics of 25 children with COVID-19

Demographics				Epidemiologic history	Treatments		
Patient	Sex	Age	Symptoms at onset	Number of family members infected	Severe complications	Mechanical ventilation	Intensive unit care
1	M	15	None	2	No	No	No
2	F	13	None	1	No	No	No
3	M	15	Cough	1	No	No	No
4	F	13	None	2	No	No	No
5	M	2	None	1	No	No	No
6	M	9	None	3	No	No	No
7	M	9	None	1	No	No	No
8	F	15	Fever; Cough	1	No	No	No
9	F	2	None	1	No	No	No
10	F	8	Cough	2	No	No	No
11	M	3	None	1	No	No	No
12	M	15	None	2	No	No	No
13	M	8	Cough	2	No	No	No
14	M	10	None	1	No	No	No
15	M	11	None	1	No	No	No
16	F	9	None	3	No	No	No
17	M	14	None	2	No	No	No
18	M	6	None	1	No	No	No
19	M	4	None	1	No	No	No
20	F	7	None	1	No	No	No
21	M	5	None	1	No	No	No
22	F	3	Fever	2	No	No	No
23	M	5	None	2	No	No	No
24	M	11	Sore throat	4	No	No	No
25	M	3	Cough	1	No	No	No

Discussion

The children in families with at least one infected member with SARS-CoV-2 are very likely to be asymptotically infected. In this study, a sample of 25 infected families were investigated; therefore,

this can be generalized to other infected families who have children. Infected families are recommended to monitor their children to ensure a timely diagnosis.

Children who are infected by SARS-CoV-2 develop mild complications, while severe complications are observed in adults [27-29]. The reason may be different immune responses in children, including strong innate and weaker adaptive immune responses, compared to adults. This may help them with the clearance of the virus and reduced secondary lymphocyte-mediated inflammation [30-33].

Given the number of infections reported, the number of infected children aged less than 15 was small. This may be due to a lower risk of exposure rather than resistance to infection. Because children have fewer outdoor activities and travelings, making them less likely to get the virus [34].

Seventeen of the 25 children infected are male. Given that there have been both male and female children in the families reported in this study, therefore male children might be more susceptible to COVID-19 infection than female children.

The study was limited by a small sample size, inclusion only of children in Dijon with a population of 155,114; therefore, it still needs further investigation.

Declarations

This study was approved by the ethics committee of Hospital Center University Dijon Bourgogne.

Conflict of Interest

The authors declare that there is no conflict of interest.

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