Anesth Crit Care 2020; 2 (3): 066-069 *DOI: 10.26502/acc.016*

Review Article

COVID19 Infection in Children: A Narrative Review

Mohammed Almuaigel[1*], Ali ALFuraidan[1], Abdulrahman Alhulaybi[1], Amro Althuwayqib[1], Khalifah Alfarhan[1], Fahad Aldossary[1], Hussain Alturki[1], Abdullah Althani[1], Mohammed Alismail[1], Mohamed AlOtaibi[1], Salem Almarri[1], Abdulrahman Alnaim[1], Naif Al Hamam[2], Khaled Yassen[3]

[1]King Faisal University, College of Medicine, Medical education department, Kingdom of Saudi Arabia

[2]Orthopaedic/Surgery Department, College of Medicine, King Faisal University, Alhassa, Hofufu, Kingdom of Saudi Arabia

[3]Anaesthesia/Surgery Department, College of Medicine, King Faisal University, Alhassa, Hofufu, Kingdom of Saudi Arabia

[*]**Corresponding Author:** Dr. Mohammed Almuaigel, College of Medicine, King Faisal University, Alhassa, Hofufu, Kingdom of Saudi Arabia, Tel: +966503888246; E-mail: Al.muaigel@hotmail.com

Received: 29 June 2020; **Accepted:** 17 July 2020; **Published**: 23 July 2020

Citation: Mohammed Almuaigel, Ali ALFuraidan, Abdulrahman Alhulaybi, Amro Althuwayqib, Khalifah Alfarhan, Fahad Aldossary, Hussain Alturki, Abdullah Althani, Mohammed Alismail, Mohamed AlOtaibi, Salem Almarri, Abdulrahman Alnaim, Naif Al Hamam, Khaled Yassen. COVID19 Infection in Children: A Narrative Review. Anesthesia and Critical Care 2 (2020): 066-069.

Abstract

Coronavirus disease 2019 (COVID-19) was named by the WHO as a pandemic disease. The aim is to review recent studies regarding COVID 19 infection in childhood in terms of the clinical features, need for critical care and mortality. Most pediatrics become infected from close contacts and then act as a virus carrier to others. The infected children are mainly asymptomatic, but unfortunately when symptomatic they an overlap with other common pediatric respiratory illnesses. Symptoms in pediatrics are mainly fever with pharyngitis, bronchitis and less likely inferior respiratory tract infections. Most pediatric patients recover well with minimal symptomatic and supportive therapy.

Keywords: Child; acute respiratory disease; COVID-19

1. Introduction

Coronavirus disease 2019 (COVID-19) is a novel coronavirus that can lead to public health threat and intensive care unit admissions. The WHO named the virus a pandemic disease as a result of the virus global wide spread following its initiation in China during December 2019 and early 2020. The overall case fatality rate of COVID-19 for all ages is estimated to be up to 3.4% globally. In this specific age population (<16 year) the COVID-19 infection presents generally as a mild disease [1,2]. The tendency of COVID 19 viral infection to present initially as a mild form was first were reported by a Chinese study that included 2134 child. This study reported only one death, and a mortality rate of 0.05% [3].

The aim of this study was to review published data concerning the clinical features, risks and consequences of the new COVID-19 among pediatrics particularly the severity of infection and need for intense care.

2. Methods

A narrative review was carried out using online databases including Cochrane Library, Pubmed, Google Scholar, Medline, WHO website using English keywords. Keywords included: Child, Acute respiratory disease; COVID-19. Finally, data of 15 related articles were retrieved after excluding correspondence, commentary and letter to editor. Publications from February to June 2020 were only included focusing on the clinical characteristics of COVID-19 infection in pediatrics (<16year) that could be of interest to the health care workers in intensive care and emergency services.

3. Discussion

Initial evidence suggests that children are infected as adults with SARS-CoV-2 but the clinical symptoms are less intense and severity of illness less frequent. Epidemiological studies showed that elder patients were more susceptible to severe forms of the diseases, while children tend to have milder symptoms with a reduced need for intense medical care A lesser percentage of children contract the virus compared to the adults. The reported incidence of infected children is only 2% in China, 1.2% in Italy and 5% in North America. The decreased susceptible to COVID-19 and the relative resistance to SARS-CoV-2. COVID-19 among this specific age group could be due to the fact that the virus uses a specific receptor to infect human cells. This receptor was found to be the angiotensin-converting enzyme 2 (ACE2) which is widely expressed in many organs, especially in lungs, but in children immune system the ACE2 expression was significantly reduced. This reduction in ACE2 expression could explain the reduced risk of contracting the COVID-19 infection among children. Initial lessons learned from adults recommend avoiding angiotensin converting enzyme inhibitors or angiotensin II type I receptor blockers. However more future research is recommended to explore the role of immunity and how the clinical symptoms are reduced among children infected with of COVID-19 compared to adults [4-6].

Children role as transmitters for the virus is suspicious. A study by Xing et al demonstrated that fecal viral-shedding can continue for weeks following the onset of

COVID infection. Fecal-oral transmission in infants and preschool aged children can lead to the further spread of the virus to other children and family members. Extreme precautions is required with children admitted to intensive care units particularly during toilet hygiene and care [7].

Majority of infected children are asymptomatic as mentioned above [3], but unfortunately these symptoms can significantly overlap with other common pediatric respiratory illnesses particularly during emergency admissios and consultations by intensive care physicians. Symptoms in pediatrics are mainly fever, cough with pharyngitis, muscle pain, diarrhea, bronchitis, but inferior respiratory tract infection are less likely. Children usually have a good prognosis and they can recover within 1-2 weeks after the onset of the disease. The main basis for diagnosis of COVID 19 infections is the real-time polymerase chain reaction (RT-PCR) for the upper or lower respiratory secretions. Mild clinical symptoms with a recent history of exposure is suspicious and should alert physicians to the possibility of COVID 19 infection. Chest CT scan can be practically difficult to detect the disease in this age group, ultrasound could help provide bedside assistance [8-13]. The mean duration of infection with COVID-19 to diagnosis ranged from 1 to 42 days as reported by Li et al in China during the early infection episode [14]. In April the first published COVID 19 infection in an infant in the Middle East was reported from Lebanon. A 16-month-old female infant presented with fever and severe diarrhea. Nasopharyngeal swabs tested positive for RT-PCR SARS-CoV-2 (COVID-19). Symptoms started six days prior to presentation with rhinorrhea, no cough or other respiratory manifestations, however rapidly developed into lobar consolidation and bronchial infiltrate as reported by the chest radiography on admission. To confuse the clinical picture further the blood culture was positive for streptococcus pneumonia, while stool and urine cultures were negative. COVID-19 symptoms among pediatrics can present in different clinical forms, including diarrhea and this should be taken in consideration. Most pediatric patients recover well with minimal symptomatic and supportive care [15].

References

1. Ji LN, Chao S, Wang YJ, et al. Clinical features of pediatric patients with COVID-19: a report of two family cluster cases. World J Pediatr 16 (2020): 267-270.
2. Panahi L, Amiri M, Pouy S. Clinical Characteristics of COVID-19 Infection in Newborns and Pediatrics: A Systematic Review. Arch Acad Emerg Med 8 (2020): e50.
3. Dong Y, Mo X, Hu Y, et al. Epidemiological characteristics of 2143 pediatric patients with 2019 coronavirus disease in China. Pediatrics (2020).
4. Yuki K, Fujiogi M, Koutsogiannaki S. COVID-19 pathophysiology: A review. Clin Immunol 215 (2020): 108427.
5. Lee PI, Hu YL, Chen PY, et al. Are children less susceptible to COVID-19?. J Microbiol Immunol Infect 53 (2020): 371-372.
6. South AM, Brady TM, Flynn JT. ACE2 (Angiotensin-Converting Enzyme 2), COVID-19, and ACE Inhibitor and Ang II (Angiotensin II) Receptor Blocker Use During the Pandemic: The Pediatric Perspective. Hypertension 76 (2020): 16-22.

7. Xing YH, Ni W, Wu Q, et al. Prolonged viral shedding in feces of pediatric patients with coronavirus disease 2019. J Microbiol Immunol Infect 53 (2020): 473-480.
8. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 395 (2020): 497-506.
9. Wu Z, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. JAMA. (2020).
10. Lipsitch M, Swerdlow DL, Finelli L. Defining the Epidemiology of Covid-19 - Studies Needed. N Engl J Med 382 (2020): 1194-1196.
11. Zhu H, Wang L, Fang C, et al. Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia. Transl Pediatr 9 (2020): 51-60.
12. Wu Z, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. JAMA (2020).
13. Park JY, Han MS, Park KU, Kim JY, Choi EH. First Pediatric Case of Coronavirus Disease 2019 in Korea. J Korean Med Sci. 2020;35(11):e124. Published 2020 Mar 23. doi:10.3346/jkms.2020.35.e124
14. Liu W, Tao ZW, Wang L, et al. Analysis of factors associated with disease outcomes in hospitalized patients with 2019 novel coronavirus disease. Chin Med J (Engl) 133 (2020): 1032-1038.
15. Mansour A, Atoui R, Kanso K, et al. First Case of an Infant with COVID-19 in the Middle East. Cureus 12 (2020): e7520.