

Acute Abdominal Pain as a Presentation of Covid-19 Infection in a Child: A Case Report

Elham Emami*

Assistant Professor, Department of Pediatric, Shahrekord University of Medical Sciences, Shahrekord, Iran.

***Corresponding Author**

Dr. Elham Emami,

Email: emami.elham2019@gmail.com

Received: January, 2021

Revised: March, 2021

Accepted: March, 2021

Abstract

Coronavirus disease 2019 (COVID-19) may present as acute abdomen although the pathophysiology remains obscure. This is a report of an 11-year-old boy, presented to the emergency department at our hospital with myalgia and gastrointestinal symptoms including non-bloody diarrhea and abdominal pain associated with nausea and intractable vomiting during the course of the disease. He also had a fever and dry cough.

On initial evaluation, his vital signs were unremarkable. Oxygen saturation was 92% in the room air. His temperature was 38°C and his respiratory rate was 17/min. An initial physical examination showed abdominal tenderness in the right lower quadrant. Laboratory analysis revealed leukocytosis and a high ESR and CRP. Therefore, he underwent appendectomy and was discharged after a few days in good condition by observing health protocols.

Keywords: Abdominal Pain; COVID-19; Child.

Conflict of interest: The authors declare no conflict of interest.

Please cite this article as: Emami E. Acute Abdominal Pain as a Presentation of Covid-19 Infection in a Child: A Case Report. J Ped Nephrol 2021;9(3):1-3.
<https://doi.org/10.22037/jpn.v9i3.33719>

Introduction

Abdominal pain is one of the most common clinical complaints. One of the most common causes of acute abdomen in children presenting to the emergency department is acute appendicitis. It is difficult to differentiate appendicitis from other causes as less than 50% of the patients present with classic symptoms (1). Classically, they present with a low-grade fever, malaise, and anorexia progressing to abdominal pain and vomiting. Moreover, it has been reported that COVID-19 presentations in children predominantly include gastrointestinal symptoms, possibly resulting in misdiagnosed appendicitis (2,3,4).

Although the cause of appendicitis remains poorly understood, studies showed that the COVID-19 outbreak might influence the number of cases, management, and outcome of acute appendicitis for several reasons (5). Appendicitis may be triggered in children by viral pathogens; therefore, Covid-19 pandemic possibly increases the number of patients undergoing appendectomy (6).

Diagnosis is usually based on clinical examination; however, other modes of investigations such as

ultrasound and CT are helpful in some difficult cases (7). A missed or delayed diagnosis can result in major complications such as appendiceal perforation.

This is a report of an 11-year-old boy who presented to the emergency department with acute abdomen and appendicitis (CA) and tested positive for COVID-19.

Case report

An 11-year-old male patient, presented to the emergency department with an ill appearance, intolerance to oral intake, intractable vomiting, ocular erythema, and a high-grade fever that hardly responded to antipyretic therapy. He also had a severe, large-volume, non-bloody diarrhea lasting for two days that was associated with fecal incontinence and dull periumbilical pain.

He reported a history of dry cough for a few days. His vital signs were blood pressure=110/70, pulse rate= 90 beats/min, temperature=38.5°C, respiratory rate=20/min, and oxygen saturation=92% in the room air. His lung exam was normal.

The abdominal exam revealed generalized tenderness without guarding.

A chest high-resolution computed tomography scan (CT scan) showed no pathologic findings. An abdominal ultrasound revealed increased echogenicity of the liver and spleen, a dilated gallbladder, and a non-compressible, blind-ended, aperistaltic tubular structure in the right lower quadrant arising from the base of the cecum.

The patient tested positive for SARS-CoV-2 infection using real-time PCR (RT-PCR) performed on nasopharyngeal swabs.

Laboratory results showed a white blood cell count (WBC) of 17.700×10^3 cells/mm³ with 13.5% lymphocytes, trace C-reactive protein, a ferritin level of 298 ng/mL (normal: 30–400 ng/mL), a D-dimer level of 356 ng/mL (normal: below 230 ng/mL), and a lactate dehydrogenase (LDH) level of 204 U/L (normal: 135–225 U/L). Other laboratory parameters were as follows: creatinine=0.6 mg/dl, CPK=75, fibrinogen=346, SGOT=24 Mkat/L, SGPT=32 Mkat/L, alkaline phosphatase=250 IU/L, and amylase=25 Mkat/L, lipase=17 Mkat/L. Blood sugar, phosphate, VBG, and serum calcium were all within normal limits.

Polymerase chain reaction of the nasopharyngeal swab for Covid-19 was positive. Considering nausea and vomiting, leukocytosis $>10,000$ white blood cells with a left shift, fever ($>37.3^\circ\text{C}$ or $>99.1^\circ\text{F}$), he had an Alvarado score of 5 (Table 1). The surgery report confirmed appendicitis.

Table 1. Alvarado score

Characteristics	Score
Right lower quadrant tenderness	2
Rebound tenderness	1
Elevated temperature ($>37.3^\circ\text{C}$ or $>99.1^\circ\text{F}$)	1
Migration of pain to the right lower quadrant	1
Anorexia	1
Nausea or vomiting	1
Leukocytosis $>10,000$ white blood cells	2
Leukocytosis with left shift	1

Pathological report: Appendix is 12cm long and has a maximum diameter of 2.5 cm with evidence of early acute appendicitis.

Discussion

In addition to respiratory symptoms, gastrointestinal symptoms such as diarrhea (3.8–10.1%), nausea (5–10.1%), vomiting (3.6–5%) and abdominal pain (2.2%) have also been reported in covid-19 (8).

Evidence from previous SARS studies indicated that coronavirus had a tropism to the gastrointestinal tract. SARS-CoV RNA was detected in stool specimens of SARS patients (9), and electron microscopy on biopsy and autopsy specimens showed active viral replications in both small and large intestines (10). Similarly, MERS-CoV may cause enteric infections as human intestinal epithelial cells are susceptible to the virus and robust viral replication could be sustained (11). The frequent occurrence of diarrhea can be explained by the gastrointestinal tropism of coronavirus infection. Infective aerosols generated from the toilet plume can lead to fomite transmission from fecal sources (12).

Several studies have gastrointestinal symptoms as part of multisystem inflammatory syndrome in children (MIS-C); therefore, it is important to start immunosuppressants for this phase of the disease (13). In patients with very severe symptoms of gastroenteritis, such as our case with fecal incontinence, one must consider appendicitis to prevent further complications.

Previous studies emphasized lack of appendicitis and the presence of ileitis, mesenteric lymphadenopathy, etc. in Covid-19. However, in our case, the pathology report confirmed appendicitis. If not diagnosed, it could have irreparable consequences for the patient (14). Therefore, clinicians should be aware of the possibility of appendicitis in covid-19.

According to a previous studies, the frequency of Covid-19 symptoms in children aged 10–19 years is as follow:

Fever, cough, or shortness of breath: 60%

Fever: 35%

Cough: 41%

Shortness of breath: 16%

Myalgia: 30%

Rhinorrhea: 8%

Sore throat: 29%

Headache: 42%

Nausea/vomiting: 10%

Abdominal pain: 8%

Diarrhea: 14%

Loss of smell or taste: 10%

It shows that, gastrointestinal symptoms are not common in this age group (15,16,17).

Gastrointestinal symptoms may occur without respiratory symptoms (15,18,19). Diarrhea, vomiting, and abdominal pain are the most common gastrointestinal symptoms reported in children (15,19,20). Acute cholestasis has been reported in adolescents (21). Gastrointestinal bleeding has been reported in adults but it has not been reported in children (15).

Conclusion

Gastrointestinal symptoms may occur without respiratory symptoms in pediatric Covid-19 and acute abdomen and appendicitis is a presentation of Covid-19 infection in children.

Conflict of Interest

The authors declare no conflicts of interest.

Financial Support

The authors declare no financial support.

References

1. Society of American Gastrointestinal and Endoscopic Surgeons: pediatric appendicitis. Jun;2020
2. Tullie L, Ford K, Bisharat M, Watson T, Thakkar H, Mullassery D et al. Gastrointestinal features in children with COVID-19: an observation of varied presentation in eight children. *Lancet Child Adolesc Heal* 2020.
3. Toubiana J, Poirault C, Corsia A, Bajolle F, Fourgeaud J, Angoulvant F et al. Kawasaki-like multisystem inflammatory syndrome in children during the covid-19 pandemic in Paris, France: prospective observational study. *BMJ* 2020;369:m2094. <https://doi.org/10.1136/bmj.m2094>
4. Zachariah P, Johnson CL, Halabi KC, Ahn D, Sen AI, Fischer A et al. Epidemiology, clinical features, and disease severity in patients with coronavirus disease 2019 (COVID-19) in a children's hospital in New York City, New York. *JAMA Pediatr* 2020:e202430.
5. Somekh I, Somekh R, Pettoello-Mantovani M, Somekh E. Changes in routine pediatric practice in light of COVID-19. *J Pediatr*. 2020;
6. Richardsen I, Schöb DS, Ulmer TF, Steinau G, Neumann UP, Klink CD et al. Etiology of appendicitis in children: the role of bacterial and viral pathogens. *J Invest Surg* 2016;29:74–79.
7. Point-of-care ultrasound facilitates bedside diagnosis of appendicitis with an appendicolith in a pediatric patient. *Pade KH. Pediatr Emerg Care*. 2018;34:818–819.
8. Inui S, Fujikawa A, Jitsu M, et al. Chest CT findings in cases from the cruise ship “Diamond Princess” with coronavirus disease 2019 (COVID-19).
9. Hung IF, Cheng VC, Wu AK et al. Viral loads in clinical specimens and SARS manifestations. *Emerg. Infect. Dis*. 2004; 10: 1550– 1557
10. Leung WK, To KF, Chan PK et al. Enteric involvement of severe acute respiratory syndrome-associated coronavirus infection. *Gastroenterology* 2003; 125: 1011– 1017
11. Zhou J, Li C, Zhao G et al. Human intestinal tract serves as an alternative infection route for Middle East respiratory syndrome coronavirus. *Sci. Adv*. 2017; 3: eaao4966.
12. Yu IT, Li Y, Wong TW et al. Evidence of airborne transmission of the severe acute respiratory syndrome virus. *N. Engl. J. Med*. 2004; 350: 1731– 1739.
13. Miller J, et al "Gastrointestinal symptoms as a major presentation component of a novel multisystem inflammatory syndrome in children (MIS-C) that is related to covid-19:a single center experience of 44 cases" *Gastroenterology* 2020;DOI;10.1053/j.gastro.2020.05.079
14. TULLIE, Lucinda, et al. Gastrointestinal features in children with COVID-19:an observation of varied presentation in eight children *The Lancet child & Adolescent Health*,2020.
15. Tian Y, Rong L, Nian W, He Y. He Y. Review article: gastrointestinal features in COVID-19 and the possibility of fecal transmission. *Aliment Pharmacol Ther* 2020;51:843
16. Xia W, Shao J, Guo Y, et al. Clinical and CT features in pediatric patients with covid-19 infection: Different points from adults. *Pediatr Pulmonol* 2020;55:1169
17. Wang D, Ju XL, Xie F, et al.(Clinical analysis of 31 cases of 2019 novel coronavirus infection in children from six provinces (autonomous region) of northern china). *Zhonghua Er Ke Za Zhi* 2020;58:269.
18. Dong Y, Mo X, Hu Y, et al. Epidemiology of COVID-19 Among Children in China. *Pediatrics* 2020; 145.
19. Lu X, Zhang L, Du H, et al. SARS-CoV-2 Infection in Children. *N Engl J Med* 2020; 382:1663.
20. CDC COVID-19 Response Team. Coronavirus Disease 2019 in Children - United States, February 12–April 2, 2020. *MMWR Morb Mortal Wkly Rep* 2020; 69:422.
21. Perez A, Kogan-Liberman D, Sheflin-Findling S, et al. Presentation of Severe Acute Respiratory Syndrome-Coronavirus 2 Infection as Cholestatic Jaundice in Two Healthy Adolescents. *J Pediatr* 2020.
22. Jaffe BM, Berger DH. The Appendix. In: Brunocardi F, Anderson D, Biliar T, Dunn D, Hunter J Matthews J, et al. *Schwartz's Principles of Surgery .9th ed*. New :McGraw Hill;2019:1073-1092.