Journal of Pediatric Surgery 56 (2021) 199–200

Contents lists available at ScienceDirect

Journal of Pediatric Surgery

journal homepage: www.elsevier.com/locate/jpedsurg

Letter to the Editor

Decreased number of acute appendicitis cases in pediatric population during the COVID-19 pandemic: Any link?

Dear Editor:

Coronavirus disease-19 (COVID-19) is caused by severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2). COVID-19 outbreak started in December 2019 as an epidemic in Wuhan, China, and has now spread around the world affecting a huge number of patients and causing a substantial burden to our health care systems [1] . The World Health Organization (WHO) recognized early (January 2020) the problem as an "international concern" and on March 11, 2020, as a pandemic.

Non-emergent surgical procedures and outpatient departments/units have been suspended in many countries, particularly in heavily affected regions, so all the hospital resources are readily available for COVID-19 patients [2]. Many institutions have also adopted various alternative diagnostic and therapeutic paths for oncological and surgical patients [3,4]. In the United States, Centers for Disease Control and the Centers for Medicare and Medicaid Services recommended that health care systems prioritize all urgent visits and consequently delay all elective procedures to mitigate the spread of COVID-19 in health care settings [5].

However, non-traumatic abdominal surgical emergencies have remained common and likely to continue to appear in the emergency units during the COVID-19 pandemic [6]. Some authors have adopted conservative treatment approaches for COVID-19 positive patients having surgical emergencies such as acute appendicitis (AA), particularly for non-complicated forms [7,8]. Jones et al. and Suwanwongse et al. recently reported a successful non-surgical management (using antibiotics) of pediatric and adult COVID-19-positive patients with classical signs of AA [9,10]. Dreifuss et al. also reported successful treatment of adults with AA during the COVID-19 pandemic using the laparoscopic approach [2]. Kvasnovsky et al. (2020) also reported that 45.5% of children with AA underwent non-operative treatment in one of the COVID-19 epicenters (New York) [11]. Certainly, "antibiotics-first" strategy may be risky and may cause increased rates of complications such as peritonitis at surgery as reported in a systematic review of Podda et al. [12].

Although the pediatric population appears to be much less affected [13], the impact and burden on pediatric clinical practice, including pediatric surgery, are substantial. Most pediatric surgery wards have experienced dramatic changes in their daily practice transforming the services into only pediatric surgical urgent-care units [14]. This has led to a marked reduction in number of outpatient visits (reduction from 92% to only 14% in one study) and elective surgeries [14].

In our pediatric surgery practice (Sarajevo, Bosnia and Herzegovina), we have noticed a substantial drop in the number of the emergent pediatric cases such as AA during the period of lockdown in Bosnia and Herzegovina that lasted from March 15 until May 25, 2020. Our pediatric surgery service covers the pediatric population of the Sarajevo Canton (~63,000 children <18 years), and represents the only pediatric surgery service in this area. During the lockdown period that also affected the pediatric population, we had only six cases of AA (all COVID-19 negative) that were treated surgically and confirmed histopathologically. Retrospective analysis of the cases for the same period 2015-2019 revealed substantially higher number (4-8 fold) of pediatric AA that were treated surgically. Our observation is consistent with that reported in a study of Tankel et al. who found a substantial drop (~41%) in the number of AA cases among the adult population in the four high-volume centers in the municipality of Jerusalem [15]. However, another study reported no changes in the frequency of AA among the adult population, [2] although a substantial decline in emergency visits was observed in the US in all age groups for other potentially life-threatening emergencies: myocardial infarction (23% decrease), cerebrovascular stroke (20%), and hyperglycemic crisis (10% decrease) [5].

The reasons behind the decrease in AA frequency during the COVID-19 pandemic remain unclear. Some authors have proposed that milder forms can be treated conservatively at home [15] or using antibiotics [9]. Snapiri et al. also reported delays in diagnosing AA in seven pediatric patients having complicated forms of AA [16]. We believe that other factors may contribute to the decrease including various infectious agents (viruses, bacteria, fungi and parasites) whose exposure in the pediatric population and a potential link to AA have been proposed [17,18]. It is also well-known that some of these pathogens may give specific histomorphological forms of AA [17]. During the lockdown period, it is likely that the exposure to various microbes has been substantially reduced and consequently affected the frequency of AA in pediatric population. Regardless the causes and numbers, all pediatric emergencies, including AA, during the COVID-19 pandemic should be promptly treated as any delay in their diagnosis and treatment may be as big of a threat as the COVID-19 virus itself.

Declaration of competing interest

The authors declare no conflict of interest.

CRediT authorship contribution statement

Zlatan Zvizdic: Conceptualization, Writing – original draft.
Semir Vranic: Conceptualization, Writing – original draft and Supervision.

Zlatan Zvizdic
Department of Pediatric Surgery, Clinical Center, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

Semir Vranic*
College of Medicine, QU Health, Qatar University, Doha, Qatar
E-mail addresses: semir.vranic@gmail.com, svranic@qu.edu.qa
*Corresponding author.

https://doi.org/10.1016/j.jpedsurg.2020.08.016

References

[1] Chan JF, Yuan S, Kok KH, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. Lancet. 2020;395(10223):514–23.
[2] Dreifuss NH, Schlottmann F, Sadava EE, et al. Acute appendicitis does not quarantine: surgical outcomes of laparoscopic appendectomy in COVID-19 times. Br J Surg. 2020;107(10):e368–9.
[3] Bartlett DL, Howe JR, Chang G, et al. Management of cancer surgery cases during the COVID-19 pandemic: considerations. Ann Surg Oncol. 2020;27(6):1717–20.
[4] Collaborative CO. Global guidance for surgical care during the COVID-19 pandemic. Br J Surg. 2020;107(9):1097–103.
[5] Killerby ME, Link-Gelles R, Haight SC, et al. Characteristics associated with hospitalization among patients with COVID-19 – Metropolitan Atlanta, Georgia, March–April 2020. MMWR Morb Mortal Wkly Rep. 2020;69(25):790–4.
[6] Parreira JG, Campos T, Antunes PSL, et al. Management of non traumatic surgical emergencies during the COVID-19 pandemia. Rev Col Bras Cir. 2020;47:e20202614.
[7] Polites SF, Azarow KS. Perspectives on pediatric appendicitis and appendectomy during the Severe Acute Respiratory Syndrome Coronavirus 2 Pandemic. J Laparoendosc Adv Surg Tech A. 2020;30(4):356–7.
[8] Collard M, Lakkis Z, Loriau J, et al. Antibiotics alone as an alternative to appendectomy for uncomplicated acute appendicitis in adults: changes in treatment modalities related to the COVID-19 health crisis. J Visc Surg. 2020;157(3S1):S33–42.
[9] Jones BA, Slater BJ. Non-operative management of acute appendicitis in a pediatric patient with concomitant COVID-19 infection. J Pediatr Surg Case Rep. 2020;59:101512.
[10] Suwanwongse K, Shabarek N. Successful conservative management of acute appendicitis in a Coronavirus Disease 2019 (COVID-19) Patient. Cureus. 2020;12(4):e7834.
[11] Kvasnovsky CL, Shi Y, Rich BS, et al. Limiting hospital resources for acute appendicitis in children: lessons learned from the U.S. epicenter of the COVID-19 pandemic. J Pediatr Surg. 2020. https://doi.org/10.1016/j.jpedsurg.2020.06.024. S0022-3468(20)30444-9.
[12] Podda M, Cillara N, Di Saverio S, et al. Antibiotics-first strategy for uncomplicated acute appendicitis in adults is associated with increased rates of peritonitis at surgery. A systematic review with meta-analysis of randomized controlled trials comparing appendectomy and non-operative management with antibiotics. Surgeon. 2017;15(5):303–14.
[13] Castagnoli R, Votto M, Licari A, et al. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection in children and adolescents: a systematic review. JAMA Pediatr. 2020. https://doi.org/10.1001/jamapediatrics.2020.1467.
[14] Tirabassi MV. Considerations for the outpatient practice in pediatric surgery during the novel SARS-CoV-2 pandemic. J Pediatr Surg. 2020;55(6):1169–70.
[15] Tankel J, Keinan A, Blich O, et al. The decreasing incidence of acute appendicitis during COVID-19: a retrospective multi-centre study. World J Surg. 2020;44(8):2458–63.
[16] Snapiri O, Rosenberg Danziger C, Krause I, et al. Delayed diagnosis of paediatric appendicitis during the COVID-19 pandemic. Acta Paediatr. 2020;109(8):1672–6.
[17] Lamps LW. Infectious causes of appendicitis. Infect Dis Clin North Am. 2010;24(4):995–1018 ix-x.
[18] Alder AC, Fomby TB, Woodward WA, et al. Association of viral infection and appendicitis. Arch Surg. 2010;145(1):63–71.