

Pediatric Patients Undergoing Surgery with Peroperative SARS-Cov-2 Infection: An Iranian Case Brief Report

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Abstract

Introduction: The present study aimed to assess COVID-19 disease complications and its related 30-day mortality in pediatric patients with perioperative SARS-CoV-2 infection who had surgery.

Materials and Methods: A multi-center, prospective, brief report of pediatric patients who had surgery at 6 hospitals in 4 cities of Khuzestan Province, South-western Iran, one of the provinces with the highest prevalence and death rates due to COVID-19 disease. COVID-19 status and its effect on the course and outcome of the patients was investigated.

Results: 246 pediatric patients who had surgery between Jan 20 and Jun 01, 2020 with a 30-day follow-up period enrolled in the study. Four (1.62%) of the 246 patients

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who underwent surgery had perioperative COVID-19 infection. The most common symptoms included dyspnea, fever, and cough. Surgical procedures included total gastrectomy and esophagojejunostomy, bilateral pleural effusions tap, catheter placement for dialysis, and CV-line placement.

Three patients had comorbidities including congestive heart failure (CHF), end-stage renal disease (ESRD), and diabetes.

Conclusion: Based on our results, it can be said that the prevalence of this disease in children is lower than the average of the society; and the outcome in younger patients seems to be better. Though it seems that COVID-19 disease is a low risk and somehow benign condition in children undergoing surgery, but due to the unpredictable nature of the disease, public health recommendations at both general and special levels have been made by the World Health Organization (WHO) to prevent the disease. Further studies with larger samples are necessary to confirm our findings and to clarify which age groups are at increased risk for developing severe COVID-19 infection and its related morbidities and death.

Keywords

- COVID-19 infection
- 30-Day mortality
- Comorbidities

Introduction

Since the end of December 2019, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has spread in Wuhan, China, and It has caused the loss of life of 462,500 people so far.¹ COVID-19 related symptoms include fever and sometimes breathing problems, such as shortness of breath, sore throat, and runny nose.² The first patients with the disease were present at the seafood market in Wuhan; however, due to the spread of the disease in people who have not been in contact with animals, the World Health Organization (WHO) has also considered human-to-

human transmission. Most countries in the world have started serious prevention programs to combat the disease. Although many attempts have been made to produce the vaccine, there is still no vaccine or antiviral drug to eradicate COVID-19 disease. Besides, there is no definitive cure, prevention or treatment for COVID-19 infections in general.

Preoperative evaluation is an essential part of the professional work of any anesthesiologist, surgeon, and intensive care specialist to ensure a low-risk and safe anesthesia, and operation as well.

Surgical patients are a vulnerable group at risk for SARS-CoV-2 infection, due to exposure to the hospital and subsequent pulmonary complications, they are also particularly sensitive to the inflammatory response of cytokines and the suppressive response of the immune system to surgery.³ Recently, an international, multi-center, cohort study was conducted at 235 hospitals in 24 countries which included all patients undergoing surgery who had SARS-CoV-2 infection, and reported that postoperative pulmonary complications occur in half of these patients, and those surgeries are associated with high mortality rates.⁴ Given the importance of postoperative pulmonary complications and mortality that affect the surgeon's evidence-based decisions making, instructions and guideline have been published for management of surgical patients during the COVID-19 pandemic. According to the scope of COVID-19 disease and considering that our country is one of the regions with conflicting statistics, it is essential for the surgeon to consider optimal use of facilities with priority to treat the associated diseases and performing necessary interventions during the outbreak. To maintain the safety of colleagues, patients and their companions, developing and following precise instructions for surgical interventions during the COVID-19 pandemic is urgently needed.

Materials and Methods

The current study is a multi-center, prospective, brief report of pediatric patients with SARS-CoV-2 infection, who had surgery at 6 hospitals in 4 cities of Khuzestan province, Southwestern Iran, one of the provinces with the highest prevalence and death due to COVID-19 disease. The study was approved by Ahvaz Jundishapur University of Medical Sciences (AJUMS) independent ethics committee or institutional review board (IRB), and all participants and their parent(s) or legal guardian signed the informed consent prior to participation.

Children with SARS-CoV-2 infection diagnosed within 7 days before or 30 days after surgery, undergoing any procedure performed by a surgeon under general, regional, or local anesthesia in an operating theater, were included.

COVID-19 diagnosis was confirmed using reverse transcription polymerase chain reaction (RT-PCR) testing of nasal swabs or broncho-alveolar lavage, followed by diagnosis of lesions through computed tomography (CT) scan of the chest according to the national guidelines.^{5,6}

Results

30-day follow-up had been reached for 246 pediatric patients who had surgery between Jan 20 and Jun 01, 2020. Four (1.62%) of 246 patients who had undergone surgery were COVID-19 infected **Table 1**.

Table1: Baseline and demographic characteristics, comorbidities, diagnostic and clinical data, and operation details

Patients	Case 1	Case2	Case3	Case4
Birth Place	Mahshahr	Sosangerd	Abadan	Ahvaz
Age (years)	12	8	9	6
Sex	Male	Female	Female	Male
Symptoms	Dyspnea	Dyspnea and Fever	Cough	Diarrhea and Fever
Comorbidities	Negative	CHF	ESRD	Diabetes
COVID-19 in Family	Negative	Negative	Positive	Negative
PCR	Positive	Positive	Positive	Positive
WBC($\times 10^9/L$)	1500	4800	3200	10600
Lymph($\times 10^9/L$)	6.4%	8.6%	7.5%	4.7%
Hb(g/dL)	10.8	11.3	9.6	9.3
PLT(10^3)	746	443	321	452
D-dimer	346	395	215	179
CT scan report	Right ground glass opacity	Bilateral ground glass opacity	Left ground glass opacity	Left ground glass opacity
CRP	2+	3+	1+	1+
Procedure	Total gastrectomy and Esophagojejunostomy	Bilateral pleural effusion tap	Catheter placement for dialysis	CV-line placement
Outcome	Discharge	Discharge	Discharge	Discharge

CHF, Congestive heart failure; ESRD, End-stage renal disease; PCR, Polymerase chain reaction.

Discussion

Based on the results of our study, 1.6% of the pediatric patients undergoing any surgical procedure were reported COVID-19-positive in terms of symptoms, PCR

and chest CT scan. Considering that this study was conducted at the peak of COVID prevalence in Iran, the results are promising.

All the four COVID-19-positive patients had underlying chronic diseases and also one of them underwent a major surgical procedure which was total gastrectomy. Eventually, all the 4 patients were discharged safely. So, despite the patients' underlying chronic diseases and different kinds of surgical procedures performed, these patients were able to overcome the infection and discharged from the hospital. Based on our results, it can be said that the prevalence of this disease in children is lower than the average of the society and also its outcomes look good in young ages. The equal prevalence of COVID-19 infection according to gender in this study is also considerable.

Ethical Consideration

This article was approved as a research project on the 31/10/2020 by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences.

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Not applicable

Conflict of interests

There is no conflict of interest

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