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Outcome of COVID-19 with Co-existing Surgical Emergencies in Children: Our Initial Experience

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ABSTRACT

BACKGROUND

COVID-19 has changed the practice of surgery dramatically globally. Pediatric surgery is not an exception. Prioritization protocols allowing us to provide emergency surgical care to the children in need while controlling the spread of the pandemic. The aim of this study is to share our experience with the outcome of children with Covid-19 who had a co-existing surgical emergency.

METHOD

It is a retrospective observational study. Epidemiological and clinical data on COVID-19 positive children with emergency surgical symptoms were collected and analyzed using SPSS 25 software. The study duration was 3 months (April to June 2020).

RESULT

Total patients were 32. Seven (21.9%) of them were neonates. Twenty-four (75%) patients were male. The predominant diagnosis was acute abdomen followed by infantile hypertrophic pyloric stenosis (IHPS), myelomeningocele, and intussusception. Only 2 patients had mild respiratory symptoms (dry cough). Fever was present in 13 (40.6%) patients. Fourteen (43.8%) patients required surgical treatment. The mean duration of hospital stay was 5. 5 ± 1. 6 days. One neonate with ARM died in the post-operative ward due to cardiac arrest. No patient had hypoxemia or organ failure. Seven health care workers, including doctors & nurses got infected with SARS CoV2 during this period.

CONCLUSION

Our study has revealed a milder course of COVID-19 in children even when present in association with emergency surgical conditions. The transmission of the disease from children to health care workers was also low. This might encourage a gradual restart to mitigate the impact of COVID-19 on children's surgery.

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KEYWORDS

COVID-19; Hypertrophic Pyloric Stenosis (IHPS); Pneumonia.

INTRODUCTION

Covid-19 storm is showing its deadly face around the world and it is still beyond prediction how long it will continue and how deadly it could be. Increasingly more people are being affected and people with co-existing diseases are suffering more [1]. The causative agent severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spreading rapidly around the world. As of 23rd July more than 15 million people got infected with SARS-CoV-2 and more than 6 million people have lost their lives because of COVID-19 [2].

Fortunately, the infection rate in children is low in comparison to adult and most cases are mild or asymptomatic. Therefore, a detailed clinical picture of Covid-19 in children is yet to come. Moreover, presentations of Covid-19 in children are more inconsistent than adults. Only around 25% of children present with common respiratory symptoms which leads delay in diagnosis & treatment and increase the risk of transmission [3-6].

As an effort to control the rapid transmission, governments & organizations around the world have implemented distancing strategies. To comply with this strategy, health care institutions have taken several measures like discouraging hospital visits for non-emergency problems, prioritization, and re-scheduling health problems according to their time sensitivity. Pediatric surgical service is also not an exception. Different hospitals and associations have formalized protocols to ensure essential surgical service for children in need and at the same time to limit the spread of the virus and also to protect the health care workers [7-10].

At the beginning of the outbreak of SARS-CoV-2 in March in our country, we have also canceled all routine surgeries for children and performing only emergency surgeries to limit the spread of the SARS-CoV-2. The aim of this study is to share our experience about the outcome of children with Covid-19 who had co-existing surgical emergency.

METHOD

This is a retrospective observational study. We reviewed the epidemiological, clinical, and laboratory data of all patients admitted in our surgery department through the emergency department and later diagnosed to have Covid-19 by RT PCR. The study duration was 3 months (April 2020- June 2020).

During this study period, only children with emergency symptoms were admitted. A nasopharyngeal swab was taken from all patients irrespective of symptoms to detect SARS-CoV-2 by RT PCR with the purpose to detect asymptomatic patients and patients with atypical symptoms. Emergency surgical services were provided immediately without delay and patients with positive test results were isolated according to the hospital protocol. We divided the test positive patients in 4 age groups for the convenience of data analysis.

Data were retrieved from hospital records and analyzed using SPSS (version 22) software. Ethical permission has been taken from the hospital ethical review board.

RESULT

Total 32 children were tested positive for SARS-CoV-2 by RT PCR. Seven (21.9%) of them were neonates (Table 1). The smallest one tested positive was 3 days old. Twenty-four (75%) patients were male. The predominant diagnosis was acute abdomen followed by infantile hypertrophic pyloric stenosis (IHPS), myelomeningocele, and intussusception (Figure 1). Only 2 patients had mild

respiratory symptoms (dry cough). Fever was present in 13(40.6%) patients.

Age group					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<1 month	7	21.9	21.9	21.9
	1month-12months	11	34.4	34.4	56.3
	>1 Year - 5 Year	5	15.6	15.6	71.9
	>5 Year	9	28.1	28.1	100
	Total	32	100	100	

Table 1: Age distribution of the patients.

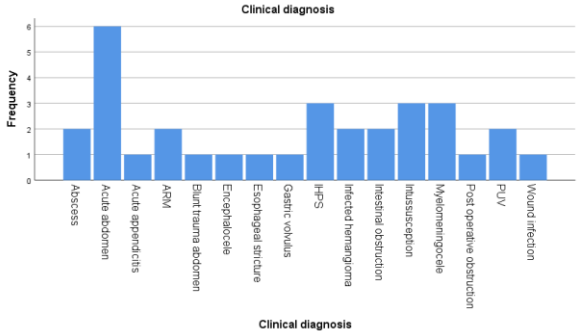

Figure 1: Clinical diagnosis of the COVID-19 positive patients.

Radiological evidence of COVID-19 was present in the chest X-ray of only one patient. Surgical treatment was provided to 14 (43.8%) patients (Table 2). The mean duration of hospital stay was 5.5 ± 1.6 days. One neonate with ARM died in post-operative ward due to cardiac arrest, other patients was discharged after managing surgical symptoms with advice for home isolation. No patient had hypoxemia or organ failure. Seven health care workers, including doctors & nurses got infected with SARS Co V2 during this period. All of them were mildly symptomatic, did not require hospital admission, and recovered smoothly.

Modality of treatment: Surgical or non-surgical					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Surgical	14	43.8	43.8	43.8
	Non-surgical	18	56.3	56.3	100
	Total	32	100	100	

Table 2: Modalities of Treatment.

DISCUSSION

COVID-19 has changed the way of surgical practice globally. This is a critical and unprecedented period, but efforts are being made to ensure inevitable, emergency surgical care of children. The system is also adapting itself as more evidence is being generated [7-11]. From the beginning of the outbreak in our country, we have adopted the protocol to continue only the emergency admission at our department and to try conservative treatment approaches whenever possible.

More than 20% of our patients were neonates. The mode of transmission in these patients was not clear. This might be due to the hiding history or reluctance of parents to test when asymptomatic or mildly symptomatic. Vertical transmission of SARS CoV2 from mother to baby is not proved yet. A high level of virus-specific IgM has been reported in neonates of the infected mother, but this is not conclusive as false positivity is high. Transmission through breast milk has also not been confirmed. Breast milk samples of mothers with COVID-19 pneumonia have been tested negative for SARS-CoV-2 [12]. These reports raise the suspicion of nosocomial transmission to neonates.

Two third of the children were male. It is not clear that the lower incidence of COVID-19 in women is also applicable to female children. Studies suggested that immune regulatory proteins encoded by the X-chromosome cause less viral load and inflammation in females than male [13].

The most common presentation was with gastrointestinal (GI) symptoms. Six patients presented with sudden onset of severe abdominal pain & several episodes of non-bilious vomiting. Laboratory investigations did not reveal any abnormality rather RT PCR for SARS Co V2 came positive. One of them had radiological evidence of COVID-19 pneumonia in chest X-ray. No one had respiratory symptoms. All of them improved with conservative treatment. GI symptoms have been reported in up to 10% of COVID-19 patients [14]. A viral infection is the cause of around 50% of intussusceptions in children. COVID-19 has also been reported to cause intussusception in children and pediatric surgeons in an epidemic area should be aware of this [15-16].

Surgical treatment was required in 14 (43.8%) patients. Others improved with conservative treatment. The personal protective equipment of the caregivers was not standard. Seven of the caregivers got COVID-19 during this period, but it was not certain whether they got the infection from the hospital or from outside. Fortunately, all of them improved without complications. The evidence available to date do not support a "child to adult" transmission of SARS Co V217-18. The mean duration of hospital stay was 5.53 ± 1.58 days. No patient had hypoxemia or organ failure. Therefore, did not require intensive care support. This is due to the milder course of COVID-19 even with co-existing surgical emergencies. This finding supports the most published series of COVID-19 in children though serious infection and even death have also been reported in children [3-6]. This might be due to different viral strains in this region or due to different immune responses to it.

Rescheduling of the non-emergent cases has already caused a huge burden on the health care system. It is still not clear how long this critical period will go on. To reduce the sufferings of children with surgical needs, a gradual start of scheduled surgeries is necessary. As children are less likely to get COVID-19 and the risk of transmission from children to adult caregivers is low, a protocol could be made for a gradual restart.

CONCLUSION

COVID-19 has made the world stand still. It is taking a toll on civilization. Fortunately, it is sparing the children so far but the impact on children's surgery is already huge. Our study has shown the milder course of the disease even with a co-existing surgical emergency in children. The transmission of the disease from children to health care workers was also low. Which might give courage to the pediatric surgeons around the world for a gradual restart.

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