Acute gastrointestinal emergencies requiring surgery in children

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ABSTRACT

Background: Although abdominal pain is common in the paediatric age group, problems of misdiagnosis and serious consequences are more particular in an emergency setting. This study examined the aetiologies of acute abdominal emergencies in children. **Materials and Methods:** This was a retrospective study of 100 children below the age of 12 years presenting with acute abdominal emergencies (gastrointestinal) requiring operative interventions. All patients were operated on an emergency basis and the intraoperative findings were correlated with the clinical findings. **Results:** Acute abdominal emergencies in the paediatric age group were heterogenous, with a myriad of aetiological factors. Overall, 73% of patients were greater than 3 years of age. Early neonatal period formed the second most common group (12%). Acute appendicitis was the most common cause except in the infancy period where congenital abnormalities predominated. **Conclusion:** The correct diagnosis of acute abdomen in children requires attention to clinical details and a high degree of suspicion. Early surgical intervention in doubtful cases may be necessary to solve diagnostic problems..

Key words: Abdominal emergencies, aetiology, children

INTRODUCTION

Abdominal pain in infancy and childhood is always a source of anxiety to the family doctor and parents. The very young patient may not be able to give any history, and when they do, the history may be unreliable. Problems of misdiagnosis and serious consequences are, therefore, more common in the paediatric age group, particularly in abdominal emergency.

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The paediatric age group constitutes a precious 30–40% of the total population in many countries.[1] There are a few specialized centers in most developing countries that cater to this precious group. Most of them are located in metropolitan cities far from the reach of the rural masses. Because delay in surgical intervention is an important determinant of successful outcome, early diagnosis and treatment is important. The purpose of this study was to examine the aetiologies of acute abdominal emergencies in children for which surgical intervention is required.

MATERIALS AND METHODS

The present study was carried out at the Department of Surgery, Indira Gandhi Government Medical College and Hospital, Nagpur, from June 2004 to December 2006. One hundred children below the age of 12 years who presented in OPD/CASUALTY with acute abdominal emergencies requiring operative interventions were studied. Acute abdominal emergencies, which were managed nonoperatively, and children operated for causes other than gastrointestinal origin were excluded. Similarly, children with abdominal trauma and children who were previously operated were also excluded.

Data regarding patient's biodata, resuscitation, history, laboratory and radiological investigations, surgery and intraoperative findings were collected on standard protocol and analysed using SPSS software (Microsoft Inc.).

RESULTS

There were 100 children, 69 (69%) were males and 31 (31%) were females (M:F = 2.22:1). Mean age of presentation was 7.09 years. Seventy-three (73%) patients were greater than 3 years of age. Early neonatal period formed the second most common group (12%) [Tables 1, 2].

The different aetiological factors of acute abdominal emergencies in children are summarised in Table 2. The largest group in this study was acute appendicitis

(58%). It was followed by intestinal obstruction (32%). Perforation peritonitis accounted for 7% of the cases. Other causes were primary peritonitis (2%), gastric volvulus (1%) and necrotising enterocolitis without perforation (1%). One patient had features of intestinal obstruction due to Meckel's diverticulum, having band and intraoperative finding of inflammed appendix.

Majority of the acute appendicitis (46.55%) occurred in the age group of 10–12 years. The most common symptom of acute appendicitis was abdominal pain and the most common sign was tenderness at McBurney's point. The rate of appendicular perforation was 13.79%. In the neonatal age group, necrotising enterocolitis was one of the most common causes of neonatal perforation peritonitis. There were two cases of primary peritonitis. Both were below 5 years of age. The morbidity and mortality rates are presented in Table 3.

Table 1: Showing age-wise distribution of patients of acute abdominal emergency

Age group	No. of cases	Percentage
0 to 7 days	12	12
>7 days to 1 month	2	2
>1 month to 1 year	5	5
>1 to 3 years	8	8
>3 to 12 years	73	73

DISCUSSION

Majority of the patients (50%) presented in less than 1 year of age. In the study of Belokar *et al.*,[2] 33.4% of the patients were below the age of 1 year. In both these series, incidence decreased with age.

Males were more commonly affected than females except in abdominal tuberculosis, which showed slight female preponderance. It is possible that the apparent male preponderance could be due to a higher rate of referral of the male child than the female child to the tertiary health centers.

The pattern and incidence of aetiologies of acute abdominal emergencies in children in the present study compared well with previous reports [Tables 4-6].[3-5]

The predominance of acute appendicitis in the present report agrees with the reports by Louw,[3] Jones,[4] Simpson *et al.*[6] and Mabiela-Babela *et al.*[5]

Similarly, intussusception was the most common aetiology for intestinal obstruction, accounting for 7% cases of acute abdominal emergencies in this study. Similar findings were reported by previous authors.[2,3,5,7-12]

Table 2: Showing distribution of patients of acute abdominal emergencies in children according to aetiology

Diagnosis	Aetiology	No. of cases	Percentage
Acute appendicitis	Acute appendicitis	45	45
N = 58 (58%)	Appendicular perforation	8	8
	Acute gangrenous appendicitis	2	2
	Acute appendicitis with abdominal Koch	2	2
	Acute appendicitis with intestinal obstruction due to Meckel's having band	1	1
Intestinal obstruction	Intussusception	7	7
N = 32 (32%)	Anorectal malformation	7	7
	Abdominal Koch	3	3
	Hirschsprung's disease	3	3
	Atresias	2	2
	Obstructed inguinal hernia	2	2
	Congenital bands and malrotation of gut	2	2
	Meckel's with band or adhesions	2	2
	Acute appendicitis with intestinal obstruction due to Meckel's having band	1	1
	Worms	1	1
	Faecolith	1	1
	Meconium ileus	1	1
Perforation peritonitis	Typhoid	3	3
N = 7 (7%)	Tuberculous	2	2
	Necrotising entercolitis	1	1
	Secondary to hindgut atresia	1	1
	Primary peritonitis	2	2
	Gastric volvulus	1	1
	Necrotising enterocolitis without perforation	1	1

N = no. of cases

Table 3: Morbidity and mortality

	Morbidity rate (%)	Mortality rate (%)
Acute appendicitis	13.79	00
Intestinal obstruction	15.62	6.25
Intussusception	00	00
Meckel's diverticulum	50	00
Perforation peritonitis	42.86	28.57

Table 4: Showing age-wise distribution in different series

Age group (Years)	Belokar *et al.* (1978)[7] (%)	Present study (2006) (%)
0 to 1	34.3	50
>1 to 5	34.3	25
>5 to 10	28.3	12.50
>10 to 12	3	12.50

Anorectal malformation was another predominant aetiology of intestinal obstruction in the present study. In a study by Sran *et al.*,[10] imperforate anus was the most common cause of intestinal obstruction in the paediatric age group. Moreover, it was the most common aetiology of intestinal obstruction in infancy, in the present study, accounting for 43.75% of the cases. Similar results were obtained by Belokar *et al*.[2]

The relative decrease in the incidence of ascariasis in the present series (3.13%) as compared with Dayalan *et al.*'s[7] study (20.7%) may be due to early deworming of children by paediatricians. Hence, the number of patients with surgical complications of intestinal worms has decreased.

There were seven cases of abdominal tuberculosis, with slight female preponderance and mostly in the age group of 5–12 years in this study, similar to the study by Agrawal *et al*.[13] The most common presentation of abdominal tuberculosis was that of intestinal obstruction, with 42.86% patients developing postoperative complications and hypoproteinemia. A higher incidence of tuberculosis of the abdomen may be the reemerging problem of tuberculosis associated with immunodeficiency and low socioeconomic status.

The most common cause of mortality was septicaemia. Peritonitis substantially increases the mortality rate. Perforation of the intestine is usually a culminating event in many pathologies and this further underlines the need to make an early diagnosis and treatment. Prompt diagnosis of relatively milder disorders like appendicitis serves to further decrease this abdominal catastrophe.

We conclude that acute appendicitis and intestinal obstruction are the most common causes of acute abdominal emergencies in children. Specially, in the postinfancy period, appendicitis is the predominant aetiology while intestinal obstruction due to congenital

Table 5: Showing comparison of various aetiological factors for acute abdomen in different studies

Aetiology	Louw (1966)[3]	Jones (1979)[4]	Mabiela-Babela (2006)[5]	Present study (2006)
Number of cases	731	363	185	100
Acute appendicitis (%)	38	29.20	30.30	58
Intussusception (%)	6.10	1	6.40	7
Obstructed and strangulated hernia (%)	Not included	0.60	22.20	2
Ascariasis (%)	12.85	-	-	1
Faecolith obstruction (%)	-	-	-	1
Peritonitis (%)	-	-	28.10	9

Table 6: Showing the relative incidences of aetiologies of intestinal obstruction in different studies

Aetiology	Dayalan *et al.* (1976)[7]	Belokar *et al.* (1978)[2]	Adejuyigbe *et al.* (1989)[8]	Present study (2006)
Number of patients	-	67	76	32
Intussusception (%)	32.30	31.30	44.70	21.87
Anorectal malformation (%)	-	16.4	-	21.87
Obstructed hernia (%)	2.90	23.80	18.40	6.25
Meckel's diverticulum (%)	3.40	3	0	6.25
Abdominal Koch (%)	4.60	4.40	0	9.37
Ascariasis (%)	20.70	3	5.30	3.13
Band obstruction (%)	2.60	0	0	6.25
Hirschsprung's disease (%)	2.90	0	0	9.37
Faecolith impaction (%)	0	0	2.60	3.13

causes tends to predominate in the neonatal and the infancy period. Early admission and surgery may solve diagnostic problems. Morbidity and mortality rates associated with acute abdominal emergencies can be reduced by early diagnosis, timely intervention and proper care.

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