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Original Research Article

A prospective study of intestinal obstruction in paediatric age group

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ABSTRACT

Background: Intestinal obstruction can occur at any age in the paediatric population1-4. Bowel obstruction in children differs from that in adults in terms of etiology, presentation and even the management. The aim of the study was to find out various etiologies, clinical features, outcome and mortality of paediatric age groups with intestinal obstruction and their relation to age and sex distribution.
Methods: This is a prospective study of 50 cases of paediatric age group with signs and symptoms of intestinal obstruction which were admitted in Sir Sayajirao Gaekwad Hospital, Vadodara, India during period of December 2004 to November 2006. Surgical intervention was carried out where indicated otherwise patients were managed conservatively. Data was analysed in SPSS version 10 statistical software for percentage and frequencies.
Results: Total 50 patients were included in the study. Among these 30 were males and 20 were females with M: F ratio of 3:2. Majority of them were 25 neonates of age group of 1-7 days (50%), followed by 7 infants of 1 months- 1 years (14%) and 18 children aged 1 years-12 years (36%). Out of 50 patients, 41 (82%) patients had congenital causes in which 21(42%) patients had imperforate anus followed by Hirschprung's disease in 8(16%), Meckel's diverticulum in 6(12%), jejunal atresia in 4(8%), hypertrophic pyloric stenosis in 2 patients (4%) and 9(18%) patients had acquired causes in which intussusception was in 5(10%) patients, abdominal tuberculosis in 2(4%) and gangrenous appendix in 2(4%) patients. Total mortality was 6 out of 25 neonates and there were no mortality in infants and children groups.
Conclusions: Majority of patients were neonates than infants and children with slight male preponderance with male: female ratio of 3:2. Congenital causes of intestinal obstruction were more common (82%) than the acquired causes (18%). Postoperative septicaemia was more common and overall mortality was exclusively in neonates.

Keywords: Anorectal malformation, Intestinal obstruction, Intussusception, Intestinal atresia, Neonate

INTRODUCTION

Intestinal obstruction can occur at any age in the paediatric population.[1-4] Bowel obstruction in children differs from that in adults in terms of etiology, presentation and even the management. It also varies with age in children of different age groups.[5,6] Paediatric surgery is a fast expanding branch and in spite of great strides it had made in last 4 decades, mortality and morbidity in children with intestinal obstruction remains apparently high. In last decades, great advances have been made in pre-and postoperative intensive care and anaesthesia. Better understanding of pathophysiology of infants and application of this knowledge to develop proper technique, improvement in diagnostic methods, and availability of better antibiotics have brought

dramatic reduction in mortality and morbidity in infants with intestinal obstruction.[7]

Though these newer methods and sophisticated facilities are available in West, and barring a few centres in our country, most of the children who require surgery are treated by the general surgeon. When a surgeon is facing this challenge, he should be knowledgeable, well prepared and aware of different types of presentation and their physiological responses to management in this age group with intestinal obstruction.

Majority of the paediatric patients with intestinal obstruction present with common symptoms of abdominal distension, constipation or failure to pass meconium, vomiting, fluid and electrolyte imbalance etc. Majority of birth defects present in neonatal age group, but infantile hypertrophic pyloric stenosis commonly occurs around the age of 3 weeks. Intussusception is commonly seen in healthy children of 6-11 months of age. The onset of signs and symptoms of intestinal obstruction also give some idea about the diagnosis.

Various causes of intestinal obstruction in paediatric age group have been described. These causes vary from country to country and region to region.[8] In a series, Belokar et al has mentioned some common causes as intussusception, infantile hypertrophic pyloric stenosis, Hirschsprung's disease, imperforate anus, meconium ileus, malrotation and volvulus, intestinal atresia, annular pancreas etc.[12] Early diagnosis and treatment is essential in intestinal obstruction in paediatric patients, otherwise it may lead to fluid and electrolyte imbalance, perforation peritonitis, aspiration pneumonitis etc. and ultimately lead to mortality.

METHODS

This was a prospective study carried out in 50 patients at Department of Surgery in Medical College and Sir Sayajirao Gaekwad Hospital, Baroda, Gujarat, India from December 2004 to November 2006. Out of them, 25 patients were neonates (1-7 days), 7 patients were infants (1 months-1 year) and 18 patients were children (1-12 years) who presented with symptoms and signs of intestinal obstruction and diagnosis confirmed by x-ray abdomen or invertogram were included in this study.

Other investigations like ultrasonography, barium study, CT scan or MRI of abdomen were performed as per requirement of specific patients. Gangrenous appendicitis that was diagnosed on clinical and radiological examination as intestinal obstruction was also included in the study. All clinical and epidemiological data were collected on a designed proforma. All the patients were managed according to standard protocols. Complete blood count, serum electrolyte and urea level were done. Patients were initially resuscitated and once stabilized then categorized in to those who needed surgical intervention and those who can safely be treated conservatively.

Surgical procedure was performed according to the pathology and condition of the patients assessed by the operating surgeon. Some postoperative patients were managed in intensive care unit while stable patients were managed in ward. All patients were followed up on regular basis after discharge from the hospital. Data were analyzed by using SPSS version 10 for percentage and frequencies.

RESULTS

During the study period, total 50 patients were included in the study. Among those 47 patients were operated and 3 were managed conservatively in which 2 patients had tuberculosis and 1 patient of intussusception was treated with hydrostatic reduction.

Table 1 shows highest incidence of intestinal obstruction in 25 neonates (50%) of age group of 1-7days followed by 7 infants of 1 months-1 years (14%) and 18 children of age 1 years -12 years (36%) (Table 1).

Table 1: Age distribution.

Age	No. of cases	Percentage
Neonates (1-7 days)	25	50
Infants (< 1 years)	07	14
Children	18	36%
Total	50	100

Table 2 shows 30 were males (60%) and 20 females (40%) with M: F ratio of 3:2 was nearly equal in both sexes with slight male preponderance (Table 2).

Table 2: Sex distributions.

Sex	No. of cases	Percentage
Male	30	60
Female	20	40
Total	50	100

Table 3 shows abdominal distension in 38 (61.7%) patients which was found to be a commonest symptom followed by failure to pass meconium in 32 (64%) patients, excessive crying in 30 (60%) patients, abdominal pain in (34%) patients, visible peristalsis in 2 (4%) patients and vomiting in 20 (40%) patients (Table 3).

Table 4 shows distribution of patients according to various causes of intestinal obstruction. Among them 41 (82%) patients had congenital causes in which 21 (41%) patients had imperforate anus followed by Hirschprung's disease in 8 (16%) patients, Meckel's diverticulum in 6 (12%) patients, jejunal atresia in 4 (8%) patients and hypertrophic pyloric stenosis in 2 (4%) patients and

acquired causes were seen in 9 (18%) patients in which intussusception in 5 (10%) patients, abdominal tuberculosis in 2 (4%) and gangrenous appendix in 2 (4%) patients. (Table 4).

Table: 3 Distribution of patients according to various clinical features.

Clinical features	No. of cases (n=50)	Percentage
Abdominal distension	38	76
Not passing stool/ muconium	32	64
Excessive crying	30	60
Abdominal pain	17	34
Visible peristalsis	02	4
Vomiting	20	40

Table 4: Distributions of patients according to various causes.

Causes	Type of lesion	No. of cases	Percentage
Congenital (n=41) 82%	Imperforated anus	21	42
	Hirschprung's diseases	08	16
	Meckel's diverticulum	06	12
	Jejunal/ileal atresia	04	8
	Hypertrophic pyloric stenosis	02	4
Acquired (n=09) 18%	Intussusception	05	10
	Abdominal tuberculosis	02	4
	Gangrenous appendicitis	02	4

Table 5 shows various overall postoperative complications that occurred in 15 (30%) patients out of 50 in which 6 (40%) patients had septicaemia, 4 (26.66%) patients had excoriation of skin, 3 (20%) patients had wound infection and retraction of colostomy were seen in 2 (13.33%) patients (Table 5).

Table 6 shows overall mortality in 6 (12%) patients out of 50 and highest mortality were seen in 6 (24%) neonates out of 25 patients. Out of 6 patients 2 patients had high variety imperforate anus with tracheo-oesophageal fistula and 4 patients had iejunal atresia.

All patients died due to postoperative septicaemia. There was no mortality in infants and children group. Duration of hospital stay ranged from 5 to 25 days. 44 (88%) patients recovered and were discharged (Table 6).

Table 5: Distributions of patients according to various postoperative complications.

Complication	No. of cases	Percentage
Wound infection	03	20
Excoriation of skin	04	26.66
Septicaemia	06	40
Retraction of colostomy	02	13.33
Total (n=50)	15	30

Table: 6 Mortality related age.

Age group	No. of cases	Mortality	Percentage
Neonates (1-7 days)	25	06	24
Infants (1 months -1 year)	07	00	00
Children1-12 years	18	00	00
Total	50	06	12

DISCUSSION

In this study, 50 patients were included during period of December 2004 to November 2006 admitted in Sir Sayajirao Gaekwad Hospital Vadodara, Gujarat, India Intestinal obstruction is the commonest surgical emergency in children apart from acute appendicitis.[13] It was the most common indication of laparotomy in paediatric patients and also forms an important cause of mortality and morbidity in them.[14,15]

This similar type of study were carried out by Gangopadhyay et al in 765 cases, Park CH and Woo et al in 77 cases and Adeyemi D et al in 211 cases and they found male and female ratio was 2.3:1, 3.2:1 and 3:1 respectively while in present study, M:F ratio was 3:2 with higher female ratio as compared to other studies (Table 7).[16-18]

Park CH and Woo et al also studied clinical features in their study in 77 paediatric patients with intestinal obstruction. He found abdominal distension as the commonest symptom in 76 % of patients followed by not passing stool/meconium in 64%, excessive crying in 60%, visible peristalsis in 34% and vomiting in 4% of patients while present study also found same features ordered in 40.6%, 11.7%, 38.6%, 41.6% and 20% patients respectively.[17]

Present study found most common cause of intestinal obstruction to be anorectal anomalies seen in 42% of patients followed by Hirschprung's disease in 16% of patients, jejunal atresia in 8% and hypertrophic pyloric stenosis in 4% of patients, whereas Gangopadhyay et al, Park CH and Woo et al and Adeyemi D et al found anorectal anomalies in 50.3%, 28.6% and 38% of

patients, Hirschprung's diasese in 15.7%, 19.5 and 14% of patients, hypertrophic pyloric stenosis in 5.5%, 23.4% and 10% of patients and intestinal atresia in 7.8%, 14% and 29% patients respectively.[16-18]

Gangopadhyay et al, Park CH and Woo et al and Adeyemi D et al also studied post-operative complications and mortality in their study and found complications in 26%, 34%, 42% and mortality in 20%, 22%, 35% of patients respectively while compared to present study, in which complications and mortality were in 30 % and 24% of patients respectively.[16,17] Postoperative shock, hypothermia, metabolic disturbances, prematurity and others with associated congenital anomalies were common causes of poor survival rate, thus we see that there is no much difference in established pattern of paediatric intestinal obstruction with respect to presentation, etiology, complication and mortality on comparing present study with those of similar studies in recent past.

In developing countries, significant percentage of deliveries is still carried out at home. Early recognition of congenital malformation may not be possible here in absence of adequately trained personnel. These neonates are brought to hospital only when they develop overt symptoms. Delay in surgery only serves to enhance the rate of complications.

The overall mortality rate in paediatric intestinal obstruction has been reducing with time because of increasing awareness, early diagnosis and intervention, improved paediatric anaesthesia, better antibiotics and improvement of post-operative care of paediatric patients.

Table 7: Comparison of present study with other studies.

Study		Gangopadhyay et al (n=765)	Park CH and Woo et al (n=77)	Adeyemi D et al (N=211)	Present study (n=50)
Sex incidence (M:F)		3.2:1	2.3:1	3:1	3:2
Clinical features	Abdominal distension	-	76%	-	40.6%
	Not passing stool/ meconium	-	64%	-	11.7%
	Excessive crying	-	60%	-	38.6%
	Visible peristalsis	-	34%	-	41.6%
	Vomiting	-	04%	-	20%
Causes	Anorectal anomalies	50.3%	28.6%	38%	42%
	Hirschprung's disease	15.7%	19.5%	14%	16%
	Hypertrophic pyloric stenosis	5.5%	23.4%	10%	4%
	Intestinal atresia	7.8%	14%	29%	8%
Post-operative complication		26%	34%	42%	30%
Mortality		20%	22%	35%	24%

CONCLUSION

In this study, there was male preponderance with M:F ratio of 3:2. Among them half of the patients were neonates. Abdominal distension (76%) was the commonest symptom than other clinical features. Congenital anorectal anomalies (42%) were more common etiology than other causes of intestinal obstruction in this study. Postoperative septicaemia (40%) was the leading complication than the others and overall mortality was 12% in patients exclusively of neonatal age.

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