

Clinic-etiologic profile of pediatric patients with intestinal obstruction and its association with age and gender

Ashoka Nand Thakur*

Assistant Professor, Department of Paediatrics surgery, Patna Medical College and Hospital, Patna, Bihar, India

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Abstract

Aim: 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. **Materials and methods:** This was a prospective study conducted in the Department of Paediatrics surgery Patna Medical College and Hospital, Patna Bihar, India for 13 months. Out of 100, 48 patients were neonates (1-7 days), 15 patients were infants (1 months-1 year) and 37 patients were children (1-14 years) who presented with symptoms and signs of intestinal obstruction and diagnosis confirmed by x-ray abdomen or invertogram were included in this study. Complete blood count, serum electrolyte and urea level were done. **Results:** Highest incidence of intestinal obstruction in 48 neonates (48%) of age group of 1-7days followed by 15 infants of 1 months-1 years (15%) and 37 children of age 1 years -14 years (37%). out of 100, 64 were males (64%) and 36 females (36%). Abdominal distension in 68(68%) patients which was found to be a commonest symptom followed by failure to pass meconium in 65 (65%) patients, excessive crying in 61 (61%) patients, abdominal pain in (31%) patients, visible peristalsis in 5 (5%) patients and vomiting in 39 (39%) patients. Out of 100, 80 (80%) patients had congenital causes in which 40 (40%) patients had imperforate anus followed by Hirschsprung's disease in 17(17%) patients, Meckel's diverticulum in 13(13%) patients, jejunal atresia in 7 (7%) patients and hypertrophic pyloric stenosis in 3 (3%) patients and acquired causes were seen in 20 (20%) patients in which intussusceptions in 12 (12%) patients, abdominal tuberculosis in 5 (5%) and gangrenous appendix in 3 (3%) patients. Overall postoperative complications occurred in 27 (27%) patients. **Conclusions:** we conclude that the congenital causes of intestinal obstruction were more common (80%) than the acquired causes (20%). Postoperative septicemia was more common and overall mortality was exclusively in neonates.

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

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Introduction

Intestinal obstruction occurs when the normal flow of intestinal contents is interrupted. This obstruction can occur at any level of the intestinal tract. Intestinal obstruction is a surgical emergency because of potential for intestinal ischaemia leading to perforation and peritonitis[1]. It is a common indication for emergency surgical procedure and can occur at any age. Paediatric intestinal obstruction differs from adult intestinal obstruction in terms of aetiology, presentation, management and outcome[2,3]. Paediatric intestinal obstruction is one of the most common causes of acute abdomen and is a common clinical condition a paediatric surgeon is called to review. Paediatric intestinal obstruction accounts for about 42% of all abdominal emergencies and 1% of all paediatric admissions[4]. The aetiology of intestinal obstruction can be congenital or acquired, mechanical or non-mechanical, extrinsic or intrinsic. The aetiology and pattern of paediatric intestinal obstruction varies based on geographical region and age distribution[5]. Children that have intestinal obstruction present with one or more of the following: abdominal pain, vomiting, constipation and/or abdominal distension. The symptomatology depends on the part of the intestine that is obstructed. For example, patient that has duodenal obstruction presents with vomiting and minimal or no

abdominal distension, while patient with Hirschsprung's disease presents with marked abdominal distension due to chronic constipation. Various causes of intestinal obstruction in paediatric age group have been described. These causes vary from country to country and region to region[6]. 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[7]. Early diagnosis and treatment is essential in intestinal obstruction in paediatric patients, otherwise it may lead to fluid and electrolyte imbalance, perforation peritonitis, aspiration pneumonia etc. and ultimately lead to mortality[8,9]. In developing countries, the outcome of paediatric intestinal obstruction is still far from encouraging with significant morbidity and mortality. This is due to late presentation, lack of paediatric intensive care unit and limited resources. However in developed countries, improvements in diagnostic investigations, proper surgical/anaesthetic techniques and good perioperative care have brought improved outcome[10].

Materials and methods

This was a prospective study conducted in the Department of Paediatrics surgery Patna Medical College and Hospital, Patna Bihar, India for 13 months.

Methodology

Out of 100, 48 patients were neonates (1-7 days), 15 patients were infants (1 months-1 year) and 37 patients were children (1-14 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

*Correspondence

Dr. Ashoka Nand Thakur

Assistant Professor, Department of Paediatrics surgery, Patna Medical College and Hospital, Patna, Bihar, India.

E-mail: ashokanandthakur@gmail.com

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. Complete blood count, serum electrolyte and urea level were done. Patients were initially resuscitated and once stabilized then categorized into 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. 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.

Statistical analysis

The recorded data was compiled entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 20 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages.

Results

During the study period, total 100 patients were included in the study. Among those 96 patients were operated and 4 were managed conservatively in which 3 patients had tuberculosis and 1 patient of intussusception was treated with hydrostatic reduction.

Table 1 shows highest incidence of intestinal obstruction in 48 neonates (48%) of age group of 1-7 days followed by 15 infants of 1 months-1 years (15%) and 37 children of age 1 years -14 years (37%) (Table 1).

Table 1: Age Distribution

Age	No. =100	Percentage
Neonates (1-7 days)	48	48
Infants (< 1 years)	15	15
Children	37	37%

Table 2 shows 64 were males (64%) and 36 females (36%) with M: F ratio of 2:1.12 was nearly equal in both sexes with slight male preponderance (Table 2).

Table 2: Gender Distributions

Gender	No=100	Percentage
Male	64	64
Female	36	36

Table 3 shows abdominal distension in 68(68%) patients which was found to be a commonest symptom followed by failure to pass meconium in 65 (65%) patients, excessive crying in 61 (61%)

patients, abdominal pain in (31%) patients, visible peristalsis in 5 (5%) patients and vomiting in 39 (39%) patients (Table 3).

Table 3 Distribution of patients according to various clinical features

Clinical features	No=100	Percentage
Abdominaldistension	68	68
Not passing stool/muconium	65	65
Excessive crying	61	61
Abdominal pain	31	31
Visible peristalsis	05	5
Vomiting	39	39

Table 4 shows distribution of patients according to various causes of intestinal obstruction. Among them 80 (80%) patients had congenital causes in which 40 (40%) patients had imperforate anus followed by Hirschprung's disease in 17(17%) patients, Meckel's diverticulum in 13(13%) patients, jejunal atresia in 7 (7%) patients and hypertrophic

pyloric stenosis in 3 (3%) patients and acquired causes were seen in 20 (20%) patients in which intussusceptions in 12 (12%) patients, abdominal tuberculosis in 5 (5%) and gangrenous appendix in 3 (3%) patients. (Table 4).

Table 4: Distributions of patients according to various causes

Causes	Type of lesion	No. of cases	Percentage
Congenital(n=80)	Imperforatedanus	40	40
	Hirschprung'sdiseases	17	17
	Meckel'sdiverticulum	13	13
	Jejunal/ilealatesia	7	7
	Hypertrophicpyloric stenosis	3	3
	Intussusception	12	12
Acquired(n=20)	Abdominaltuberculosis	5	5
	Gangrenousappendicitis	3	3

Table 5 shows various overall postoperative complications that occurred in 27 (27%) patients out of 27 in which 12 (44.44%) patients had septicaemia, 6 (22.22%) patients had excoriation of skin,

5 (18.52%) patients had wound infection and retraction of colostomy were seen in 4(14.81%) patients (Table 5).

Table 5: Distributions of patients according to various postoperative complications

Complication	No. =27	Percentage
Wound infection	5	18.52
Excoriation of skin	6	22.22
Septicaemia	12	44.44
Retraction of colostomy	4	14.81

Table 6 Mortality related age

Age group	No. of cases	Mortality	Percentage
Neonates (1-7days)	48	11	22.92
Infants (1 months-1 year)	15	00	00

Children 1-12 years	37	00	00
Total	100	11	11

Table 6 shows overall mortality in 11 (11%) patients out of 100 and highest mortality were seen in 11 (22.92%) neonates out of 48 patients. Out of 11 patients 3 patients had high variety imperforate anus with tracheo-oesophageal fistula and 8 patients had jejunal atresia. All patients died due to postoperative septicaemia. There was no mortality in infants and children group. Duration of hospital stay ranged from 7 to 30 days. 89 (89%) patients recovered and were discharged (Table 6).

Discussion

Intestinal obstruction is the commonest surgical emergency in children apart from acute appendicitis[11]. It was the most common indication of laparotomy in paediatric patients and also forms an important cause of mortality and morbidity in them[12,13].

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 2:1.12 with higher female ratio as compared to other studies[14-16].

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 shows abdominal distension in 68(68%) patients which was found to be a commonest symptom followed by failure to pass meconium in 65 (65%) patients, excessive crying in 61 (61%) patients, abdominal pain in (31%) patients, visible peristalsis in 5 (5%) patients and vomiting in 39 (39%) patients[15].

Present study found most common cause of intestinal obstruction had congenital causes in which 40 (40%) patients had imperforate anus followed by Hirschsprung's disease in 17(17%) patients, Meckel's diverticulum in 13(13%) patients, jejunal atresia in 7 (7%) patients and hypertrophic pyloric stenosis in 3 (3%) patients and acquired causes were seen in 20 (20%) patients in which intussusceptions in 12 (12%) patients, abdominal tuberculosis in 5 (5%) and gangrenous appendix in 3 (3%) 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, Hirschsprung's disease 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[14-16].

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 27 % and 22.92% of patients respectively[14,15]. 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.

Conclusion

We conclude that the congenital causes of intestinal obstruction were more common (80%) than the acquired causes (20%). Postoperative septicaemia was more common and overall mortality was exclusively in neonates.

References

- Huci T. Acute GI obstruction. *Best Pract Res ClinGastroenterol.* 2013; 27(5):691-707.
- Bhedi A, Prajapati M, Sarkar A. A prospective study of intestinal obstruction in paediatric age group. *IntSurg J.* 2017; 4(6):1979-1983.
- Ooko PB. The spectrum of paediatric intestinal obstruction in Kenya. *The Pan African Medical Journal.* 2016; 24:43.
- Adejuyigbe O, Fashakin EO. Acute intestinal obstruction in Nigerian children. *Trop Gastroenterol.* 1989; 10(1):33-40.
- Mansi Shah, Jared Gallaher, Nelson Msiska, Sean E. McLean, Anthony G Charles. Pediatric Intestinal Obstruction in Malawi: Characteristics and Outcome. *Am J Surg.* 2016; 211(4):722-726.
- Saran HS, Dandia SD, Pendse AK. Acute intestinal obstruction A review of 504 cases. *J Ind Med Assoc.* 1973; 60(12):455-60.
- Belokar WK, Subrahmanyam M, Anant KS, Ingole NS, Kolte R. Pediatric acute intestinal obstruction in Central India. *Indian J Pediatr.* 1978;45(365):201-5.
- Mareshwari M, Tanwani R, Patel M, Joshi A, Jain R, Praneeth E. Intestinal Obstruction in Pediatric Age Group: A Clinicopathological Study. *Ann. Int. Med. Den. Res.* 2016;2(6):SG28-30.
- Chitumalla PK, Vemulapally NK, Reddy SN. Clinical study of bowel obstruction in relation to etiological factors. *IntSurg J.* 2017;4:485-90.
- Harissou Adamou, Ibrahim AmadouMagagi, OumarouHabou, OusseiniAdakal, KabirouGaniou, MagagiAmadou. Acute mechanical intestinal obstruction in children at zinder national hospital, Niger: Aetiologies and prognosis. *Afr J Paediatr Surg.* 2017; 14(3):49-52.
- Pujari AA, Methi RN, Khare N. Acute gastrointestinal emergencies requiring surgery in children. *Afr J Pediatric Surg.* 2008;5(2):61-4.
- Ghritlaharey RK, Budhwani KS, Shrivastava DK. Exploratory laparotomy for acute intestinal conditions in children: a review of 10 yrs of experience with 334 cases. *Afr J Pediatr Surg.* 2011; 8(1):62-9.
- Sheikh KA, Baba AA, Ahmed SM, Shera Ah, Patnaik R, Sherwani AY. Mechanical small bowel obstruction in children at a tertiary care centre in Kashmir. *Afr J Pediatr Surg.* 2010; 7(2):81-5.
- Gangopadhyay AN, Sinha CK. pediatric intestinal obstruction 10 year surgeon. *1996;1:29-32.*
- Park CH, Woo Ho, Youn HS. Clinical study on neonatal obstruction. *J Korean Neonatal.* 1997;4(2):226-32.
- Adeyemi D. Paediatrics intestinal obstruction in a developing tropical country; Pattern, problem and prognosis. *J. Trop Pediatr.* 1989;35(2):66-70.

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