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Research Article

Clinical study and management of intestinal obstruction in infants

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ABSTRACT

Background: Intestinal obstruction is a common surgical emergency in infants. There is a regional variation in the etiology of this condition. This study was conducted to determine the aetiology, clinical presentation of intestinal obstruction in infants, and outcome of surgical management.
Methods: This prospective descriptive study was conducted in department of surgery at a tertiary care teaching hospital at Solapur, Maharashtra, India from January 2011 to December 2013. All the patients, irrespective of sex with diagnosis of intestinal obstruction undergoing surgical intervention were included in the study. Surgical findings were recorded and in the postoperative period patients were followed up for detection of complications and their treatment.
Results: 50 patients were treated for intestinal obstruction with male to female ratio of 1.9:1. Majority of them (76%) presented within 1 month after birth. Abdominal distension and vomiting were the prominent symptoms of presentation. Wound infection was the commonest postoperative complication.
Conclusions: Anorectal malformation was the most frequent cause of intestinal obstruction in our patients followed by intestinal atresia. Septicaemia was the commonest cause of death in post-operative period. Associated congenital anomalies increased the morbidity and mortality.

Keywords: Intestinal obstruction, Infants, Aetiology, Outcome

INTRODUCTION

Intestinal obstruction is the commonest surgical emergency encountered in newborns. Newborn up to the age of 1 year is referred to as an infant whereas newborn up to 28 days is referred as neonate.[1] The new-born is both physically and physiologically distinct from the adult patient in several respects. The smaller size, immature organ systems, and differing volume capacities present unique challenges towards perioperative management.

In developing country like India, toady also expert paediatric surgical facilities are not available in every tertiary care centers and paediatric surgical cases are operated by general surgeons. The management of these cases remains challenging and outcome is not so good as compared with the results from the developed countries. Present study was conducted to determine the aetiological spectrum, clinical presentation, and outcome of surgical treatment of intestinal obstruction in infants in our setup.

METHODS

After obtaining the institutional ethics committee approval, present prospective descriptive study was carried out in department of surgery at a tertiary care teaching hospital at Solapur, Maharashtra, India.

Ours is a rural tertiary care center surrounded by many villages. We don't have separate paediatric surgical unit in our set up but have neonatal and paediatric intensive

care units. Present study was carried out for a period of 3 years (January 2011 to December 2013) on 50 patients.

Inclusion criteria

- All the patients up to the age of 1 year, regardless of gender, presented with intestinal obstruction and undergone surgical interventions were included.

Exclusion criteria

- Patients more than 1 year of age and patients with paralytic ileus
- Patients presenting with adhesive intestinal obstruction after index surgery
- Inoperable patients or when the parents/guardian refused surgical treatment.

On admission detailed history and thorough clinical examination was performed as per proforma. The data regarding age, sex, hospital/home delivery, vaginal / caesarean delivery, preterm /Full term, weight of baby after birth, duration of symptoms, associated congenital anomalies, socioeconomic status of parents, were documented. Preterm means less than 37 completed weeks of gestation and full term means between 37 and 42 completed weeks of gestation. Newborns having birth weight less than 2.5 kg were considered as low birth weight babies. After admission, initially all patients were put on intravenous fluids, antibiotics and nasogastric decompression was done. After correction of dehydration and electrolyte imbalance necessary laboratory and radiological investigations were carried out. Laboratory investigations included complete blood count, serum creatinine, serum electrolytes, etc. Radiological investigations included abdominal X-ray, ultrasound and contrast studies in some cases.

The diagnosis of intestinal obstruction was made on the basis of detailed history, clinical findings, and radiological investigations. Blood grouping and cross matching was done before surgery because even a small amount of blood loss may require blood transfusion in newborns. Necessary surgical intervention was performed after adequate resuscitation and after taking due informed written consent of the parents or legal guardian.

Depending upon the diagnosis and condition of patient appropriate surgical procedure was performed. Operative details like cause of obstruction, site of obstruction and operative procedure performed were recorded. In this study, we considered only initial surgical procedure in case of staged operations. Whenever required, specimen was sent for histopathological examination for definitive diagnosis. Postoperatively, patients were shifted to either neonatal or paediatric intensive care unit for continuous monitoring. Patients were examined daily for detection of early postoperative complications if any.

After discharge they were followed up for first 6 months for detection of late complications. The data collected were entered into MS-Excel sheets and analysis was carried out using statistical package for social sciences (SPSS-version 16). On the basis of analysis and observation, results were drawn and discussed and compared with other relevant literatures.

RESULTS

During the study period, total 50 patients admitted in surgical ward with the diagnosis of intestinal obstruction and underwent surgical intervention.

Table 1: Age distribution.

Age range	No. of cases	Percentage
0-1 month	38	76%
2-6 months	4	8%
7-12 months	8	16%

Majority of patients (76%) presented within 1 month after birth.

Table 2: Sex incidence.

Sex	No. of cases	Percentage
Male	33	66%
Female	17	34%

Out of 50 cases studied, 33 were male and 17 were females. Thus males outnumbered the females with male to female ratio of 1.9:1.

Table 3: Aetiology of intestinal obstruction.

Aetiology	No. of cases	Percentage
Imperforate anus	13	26%
Intestinal atresia	11	22%
Intussusception	9	18%
Malrotation of gut	8	16%
Hirschsprung's disease	4	8%
Meckel's diverticulum	2	4%
Meconium ileus	2	4%
IHPS	1	2%

Imperforate anus (26%) was the commonest cause of intestinal obstruction followed by intestinal atresia (22%) in our study.

Abdominal distension (86%) and vomiting (84%) were the predominant symptoms of presentation in our patients.

Surgical site infection was the commonest post-operative complication noted in our study. It was closely followed by septicaemia.

Table 4: Clinical features.

Clinical features	No. of cases	Percentage
Abdominal pain	11	22%
Abdominal distension	43	86%
Vomiting	42	84%
Constipation	23	46%
Failure of passage of meconium	27	54%
Lump in abdomen	7	14%
Passage of bloody stools	3	6%

Table 5: Operative procedures performed.

Procedure	No. of cases	Percentage
Colostomy	13	26%
Duodeno-duodenostomy	2	4%
Ladd's procedure	7	14%
Cut back anoplasty	4	8%
Reduction of intussusception	7	14%
Ramstedt's pyloromyotomy	1	2%
Bishop-Koop Procedure	2	4%
Bowel resection and anastomosis	13	26%
Reduction of volvulus with diverticulectomy	1	2%

Table 6: Post-operative complications.

Complications	No. of cases	Percentage
Surgical site infection	10	20%
Wound dehiscence	5	10%
Septicaemia	9	18%
Pneumonia	4	8%
Colostomy prolapse	1	2%
Anal stenosis	1	2%
Fecal fistula	2	4%
Incisional hernia	2	4%
Adhesive bowel obstruction	2	4%

Table 7: Congenital anomalies detected in patients with intestinal obstruction.

Cause of intestinal obstruction	Congenital anomaly	No. of cases
Imperforate anus	Tracheo-esophageal fistula with Congenital Talipes Equinus Varus (CTEV)deformity	1
	Down's syndrome	1
	VUR (Vesico-ureteric reflux)	1
Malrotation of gut	Right PUJ (Pelvi-ureteric junction obstruction)	1
	Congenital hydrocele	1
Colonic Atresia	Ectopic right kidney	1
Jejunal atresia	Cyanotic heart disease	1

Table 8: Overall mortality rate.

Total cases	Deaths	Percentage
50	13	26%

Overall mortality in our study was 26%.

Table 9: Comparison of mortality in preterm and full term newborns.

Newborns	Total cases	Deaths	Percentage
Preterm	10	6	60%
Full term	40	7	17.5%

Mortality in preterm (60%) was much higher than in full term newborns (17.5%) with intestinal obstruction.

Table 10: Outcome of surgical treatment.

Diagnosis	Total cases	Deaths	Mortality (%)
Imperforate anus	13	1	7.69%
Intestinal atresia	11	8	72.7%
Intussusception	9	0	0%
Malrotation of gut	8	3	37.5%
Hirschsprung's disease	4	0	0%
Meckel's diverticulum	2	1	50%
Meconium ileus	2	1	50%
IHPS	1	0	0%

Highest mortality (72.7%) was observed in cases of intestinal atresia followed by malrotation of gut. There was no mortality in cases of intussusceptions and Hirschsprung's disease.

Figure 1: Ramstedt's pyloromyotomy in case of IHPS.

Figure 2: Type III-A colonic atresia.

Figure 3: Plain abdominal radiograph showing "double bubble" sign suggesting duodenal atresia.

Figure 4: Ileal atresia.

Figure 5: Ileocolic intussusception.

Figure 6: Sigmoid loop colostomy.

Figure 7: imperforate anus.

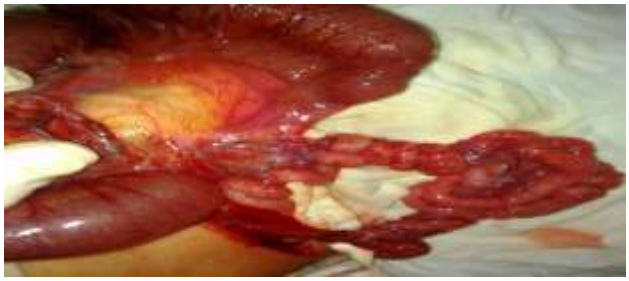

Figure 8: Jejunal atresia.

DISCUSSION

Intestinal obstruction is the common surgical emergency in infants and its management remains challenging. No age is immune for intestinal obstruction. Most of the patients in our study were neonates (76%) and presented within 1 month after birth. 8% patients presented between 2 to 6 months and 16% patients presented between 7 to 12 months.

Males outnumbered the females in this study with male to female ratio of 1.9:1. Similar observations indicating male predominance were reported by other studies.[2,3] These findings are in contrast with the studies conducted by Shakya VC et al, Burjonrappa S et al, Ekwunife OH et al where females were more than males.[4-6]

Imperforate anus was the commonest cause of intestinal obstruction in our study. Small bowel atresia was the second most common cause of intestinal obstruction.[7,8] The pattern of the etiology of intestinal obstruction in this study agrees with previously reported various national and international studies.[9-13]

The most common clinical symptoms at the time of hospitalization in our patients were abdominal distension (86%) and vomiting (84%). These findings are almost consistent with the other studies.[2,12,14] As a rule, bilious vomiting in a newborn should be considered due to intestinal obstruction unless proved otherwise.[14-16] Wound infection was the commonest post-operative complication noted in our study. Similar observation was also reported by other studies.[12,17]

The overall mortality rate in our study was 26%. This figure is comparable with the studies reported by Adeyemi D et al and Nasir GA et al.[18,19] The presence of other associated congenital anomalies increased mortality rate in these patients. In our study, maximum mortality was observed in neonates especially in cases of intestinal atresia. Study conducted by Chirdan LB et al at Jos University teaching hospital, Jos, Nigeria reported high mortality in cases of intestinal atresia.[20] In intestinal atresia, mortality was highest in cases of duodenal atresia in our study. Similar findings are reported in the studies conducted by Vecchia LKD et al.[21] The mortality rates in India and developing countries tend to be very high

because the infants are usually underweight and brought late to hospital as compared to the western world.[22,23]

CONCLUSION

Imperforate anus (Anorectal malformation) is the leading cause of intestinal obstruction in our study. Delayed presentation, prematurity, low birth weight and associated congenital anomalies increased morbidity and mortality in these patients. Post-operative management and nursing care is as important as operative skill for eventual recovery of these patients. Early diagnosis and treatment, availability of neonatal and paediatric intensive care units, leads to better outcome.

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