

# Etiological Spectrum of Acute Intestinal Obstruction in Neonates and Children in North Karnataka

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## ABSTRACT

We analyzed the neonates and children presenting with acute intestinal obstruction to our department and did an outcome analysis to identify the factors affecting the morbidity and mortality. Over a period of 7 years, 300 cases of acute intestinal obstructions accounted for 30% of the abdominal emergencies in our setup. Intussusceptions were the commonest followed by intestinal atresia. Transfer to the tertiary care center was delayed by more than 3 days after the diagnosis in 60% of the hospital and 80% of the home delivered neonates. The overall mortality rate was 5% (15 out of 300); however, it was significantly higher in neonates (10%, 9 out of 90). Inadequate perinatal care, prematurity, associated congenital anomalies and delayed referrals were the significant contributing factors for mortality. First contact community physician and their continuing medical education especially regarding the neonatal intestinal obstruction will have a significant role to play.

**Key words:** Intussusception, Intestinal atresia, Intestinal obstruction, Malrotation.

## INTRODUCTION

Gastrointestinal obstruction (GIO) is a common Pediatric surgical emergency. <sup>[1]</sup> GIO in the pediatric age group may be due to a variety of congenital and acquired conditions. The individual incidences of these conditions vary widely. <sup>[2]</sup> Children, especially the neonates, with unrecognized GIO deteriorate rapidly to such an extent that even an appropriate surgical intervention in such a baby may become hazardous. <sup>[2]</sup> Hence, an early diagnosis and the timely intervention are extremely helpful in improving the outcome in GIO. The outcome also depends upon the associated co-morbidities. The social and cultural habits and the taboos are the other important factors influencing the pattern and course of the disease and the outcome. <sup>[3]</sup> Hence, extrapolation of the western data

may not be relevant to our circumstances. The present study analyses the results of acute intestinal obstruction in neonates and children along with important medical and social predictors of outcome.

## MATERIALS AND METHODS

This study consisted of 300 consecutive patients presenting with features of GIO admitted to the Neonatal and Pediatric surgery department between July 2009 and June 2016.

The detailed history was recorded and a clinical examination performed. Routine hematological and biochemical investigations along with the relevant imaging studies were performed in all the patients. The general resuscitative measures were instituted and the appropriate surgical intervention was performed as per the

standard procedure described for a particular condition.

The children with esophageal atresia, anorectal anomalies, adhesive intestinal obstruction not requiring surgery, intussusceptions treated with hydrostatic reduction and peritonitis without mechanical obstruction were excluded from this study. The study was approved by the institutional review board and had informed consent of all the parents.

## RESULTS

Out of 300 consecutive cases of acute intestinal obstruction undergoing surgical treatment, 210 (70%) were males and 90(30%) were females (M: F: 7:3). The children aged between 1-12 months constituted 40% (n=120) of the patients and 30% (90) were neonates (0-1 month) (Table-1). Out of 90 neonates, 60 were born in the hospitals and 30 were home delivered. Sixty percent of the hospital delivered babies took more than 3days to reach our unit as compared to 80% of home delivered babies.

**INTESTINAL ATRESIAS:** Intestinal atresias were the commonest in neonates and accounted for 20% of the cases. Out of 60 cases of intestinal atresias, antenatal diagnosis was possible only in 12 cases, which had associated polyhydramnios. Duodenal, jejuna and ileal atresia were seen in 18(30%), 12(20%) and 30(50%) cases respectively. Malrotation, congenital band obstruction, Obstructed hernia, colonic atresia and infantile hypertrophic pyloric stenosis were other causes of GIO in neonates(Table-2).

Out of 18patients of duodenal atresias, 12 were male and 6 female. Associated congenital anomalies were congenital heart disease (50%), Down's syndrome (33%) and annular pancreas (33%). All the neonates underwent duodenoduodenostomy, three patients developed septicemia unresponsive to treatment and expired.

Out of 12(20%) cases of jejuna atresias, 3 had patients had multiple atresias, All the patients underwent excision of the

atretic segment and anastomosis. Postoperatively, three neonate had anastomotic dehiscence developed septicemia and expired, and remaining 9 patients were discharged.

Among the 30 ileal atresia patients, six patients had malrotation of the gut as well. All the patients underwent repair of atresia. All 30 patients were discharged uneventfully. Out of the 9 babies 6 babies who expired, had intestinal atresias.

**INTUSSUSCEPTION:** Intussusceptions are the commonest for GIO in our study and accounted for 33 %( 100) of the cases. Out of 100 patients, 80% were between 6 month to 1 year of age, 20% were above 1 year, 75% patients presented with vomiting, 60% with abdominal distension, 40% with constipation and 20% with fever. Only 35% of the patients had bleeding per rectum. 60% patients underwent resection and anastomosis and 40% required manual reduction of the intussusception. 80% patients with ileo-colic intussusception had marked polypoidal hyperplasia of lymphoid patch in the terminal ileum, which probably acted as the pathological lead point. Twelve patients of ileocolic intussusception had Meckel's diverticulum as the pathological lead point. There was no mortality.

**INFANTILE HYPERTROPHIC PYLORIC STENOSIS (IHPS):** Out of 54(18%) patients, 48 were males and 6 were females. six patients had associated congenital heart disease. Fifty-one patients presented at 6 to 8 weeks of age, whereas three patients presented within 4 weeks of age. All the patients were discharged uneventfully after Ramstedt's pyloromyotomy.

**MALROTATION:** Out of 24 patients, 12(50%) were males and 12(50%) were females. Twelve (50%) patients were less than one month old. Three patients each had associated Meckel's diverticulum and volvulus of the intestines. All the patients underwent Ladd's procedure. Three children developed septicemia; however, all the patients went home.

**ADHESIVE INTESTINAL**

**OBSTRUCTION:** Out of 18 children, 9 were secondary to post bowel resection and anastomosis, and three secondary to Ladd's procedure, colostomy for Hirschsprung's disease and appendectomy. All the obstructions developed within a year of the surgical procedure. All patients underwent adhesiolysis and 6 children required excision of the gangrenous segment and anastomosis.

**OBSTRUCTED HERNIA:** All the 15 patients had right sided inguinal hernia and all of them were males. Most of the patients (12 out of 15) were aged between 1 and 12 months. Three patients required excision of the gangrenous bowel in addition to the herniotomy.

**BAND OBSTRUCTION:** All the 9 patients of band obstruction were male and three children was less than 1 month of age. All patients underwent release of the congenital bands.

**WORM OBSTRUCTION:** Out of 9 patients, 6 were males and 3 female, aged between 1 and 6 years. six (66%) patients underwent enterotomy for removal of the worms whereas three patients required resection of the gangrenous ileum. All the patients went home.

**MECKEL'S DIVERTICULUM:** Six patients were males, aged above one year. All of them presented with vomiting, abdominal distension, fever and constipation. Rectal bleeding occurred in three patients. Both patients were discharged uneventfully after Meckel's diverticulectomy.

**COLONIC OBSTRUCTION:** Three neonates had colonic atresia, underwent repair of the atretic colon. Postoperatively one patient developed septicemia and expired. Remaining had uneventful recovery after surgery.

**ABDOMINAL TUBERCULOSIS:** Two patients with abdominal tuberculosis were older than one year. All Patients underwent excision of the omental band and adhesiolysis.

**Table 1 - Age and Sex distribution of cases**

Age in months	Sex	
	Male (n=210)	Female(n=90)
0-1 (n=90)	20	10
1-12(n=120)	28	12
>12(n=90)	22	8

**Table – Distribution of etiology of gastrointestinal obstruction**

Cause of GIO	No of patients
Intestinal atresias	20% (n-60)
Intussusception	33 % (n- 100)
Infantile Hypertropic Pyloric Stenosis	18% (n-54)
Malrotation	8% (n-24)
Adhesive intestinal obstruction	6% (n-18)
Obstructed hernia	5% (n-15)
Band obstruction	3% (n-9)
Worm obstruction	3% (n-9)
Meckel's diverticulum	2% (n-6)
Colonic obstruction	1% (n-3)
Abdominal tuberculosis	0.66% (n-2)

## DISCUSSION

In a society like ours, many children admitted with mechanical small bowel obstruction are from the rural areas. They are both misdiagnosed in peripheries and referred late to the tertiary care centers as well as they may report late because of ignorance, illiteracy and the financial constraints. In our series, 300 cases of acute intestinal obstructions accounted for 30% of the pediatric abdominal emergencies at our center. Many studies in Western and South African countries show similar etiological prevalence as in our institute. [4-6]

It is expected that the hospital delivered babies would promptly be referred to Pediatric surgical service whenever required. However, 60% of these babies reached our center more than 3 days after diagnosis which was not significantly different from the home delivered babies. Delayed referral not only leads to poor general condition but also creates nutritional issues as the institution of postoperative enteral feeds is delayed by those many days. Besides delayed diagnosis and failure to institute the timely surgical intervention, poor financial health of the parents was equally to blame. In absence of organized health insurance, the relations are left to fend for themselves and the valuable time is lost to arrange finances to go to a tertiary center. Needless to say, all the neonates who expired belonged to the late arrival group. The practice of in-utero transfer of high risk

babies to the specialized centers is non-existent in our country.

Intussusception is the most common (25%) followed by Intestinal atresia (20%) and infantile hypertrophic pyloric stenosis (18%) and malrotation (7%). Most common associated anomalies in neonates were congenital heart disease, Down's syndrome and malrotation. A similar spectrum of associated anomalies has been observed by others as well. [6-8] However, there were several differences observed in the presentations in different groups of GIO as compared to the classical descriptions. [4,9,10] Common postoperative complications in our series were wound infection (20%), anastomotic leak (15%) and sepsis (6%), similar to other reports. [4,9,10] Most common cause of the mortality was postoperative septicemia. The rate of sepsis was high when compared to the reported data from the developed countries. [11-13]

Poor peri-natal facilities leading to inadequate preparation for surgery, home deliveries, lack of parenteral nutrition are other factors affecting mortality rates in GIO especially so in neonates. Assessment of exact quantification and contribution of each factor may not be possible. However, continuing medical education of the community physician for early diagnosis and timely referral will go a long way in eliminating the significant contributing factors for the mortality in neonatal intestinal obstructions. In addition there is need to strengthen the antenatal diagnosis.

## CONCLUSIONS

Inadequate perinatal care, prematurity, associated congenital anomalies and delayed referrals were the significant contributing factors for mortality. Early diagnosis and the timely referral to a higher center should markedly decrease the mortality in pediatric intestinal obstructions. There is urgent need to strengthen the primary care especially in relation to obstetric services in the community. First contact community physician and their continuing medical

education especially regarding the neonatal intestinal obstruction will have a significant role to play.

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## REFERENCES

1. Bickler SW, Kyambi J, Rode H. Pediatric surgery in Sub Saharan Africa. *PediatrSurgInt* 2001; 17:442-447.
2. Hajivassiliou CA. Intestinal obstruction in neonatal/pediatric surgery. *Seminars in PediatrSurg* 2003; 12: 241-253.
3. Adeyemi S. Prognostic factors in neonatal intestinal obstruction: A prospective study of Nigerian newborns with bowel obstruction. *J PediatrSurg* 1988; 23: 135-138.
4. Ameh EA, Chirdan LB. Neonatal intestinal obstruction in Zaria, Nigeria. *East Afr Med J* 2000; 77:510-513.
5. Rescorla FJ, Grosfeld JL. Intestinal atresia and stenosis: Analysis of survival in 120 cases. *Surgery* 1985; 98: 668-676.
6. DallaVecchia LK, Grosfeld JL, West KW, Rescorla FJ, Scherer LR, Engum SA. Intestinal atresia and stenosis: a 25-year experience with 277 cases. *Arch Surg* 1998; 133:490-497.
7. Alastair JWM, Rude H, Cywes S. Intestinal atresia and stenosis In :Paediatric surgery. Ashcraft KW, Murphy, Sharp, Sigalet, Snyder (eds) 3<sup>rd</sup> edition, 2<sup>nd</sup> volume, Philadelphia: WB Saunders, 2000; 406.
8. Adeyemi SD. Duodenal obstruction in Nigerian newborns and infants. *Scand J GastroenterolSuppl* 1986; 124:157-161.
9. Adejuyigbe O, Fashakin EO. Acute intestinal obstruction in Nigerian children. *Trop Gastroenterol* 1989;10:33-40.
10. Olumide F, Adedeji A, Adesika AO. Intestinal obstruction in Nigerian children: *J Pediatr Surg*. 1976; 11:195-204.

11. Adeyeni D. Intestinal pattern, problems, and prognosis. *J Trop Pediatr* 1989; 35:66.
12. Amen EA, Dogo PM, Madu PT. Emergency neonatal surgery in a developing country. *Pediatr Surg Int* 2001; 17:448-451.
13. Eradi B, Narasimhan KL, Rao KLN. Waterston's classification revisited: its prevalence in developing countries. *J Indian Assoc Paediatr Surg* 2003; 8:58-63.

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