Neonatal Gastrointestinal Emergencies in a Tertiary Care Center in Bhopal, India: A Prospective Study

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Abstract

Background: In emergency neonatal surgery is challenging and difficult, causing high morbidity and mortality. In our country, only few reports are there about the results and consequences of acute surgical abdominal emergencies in newborns.

Objective: The aim of present study was to determine the etiology and clinical results in neonates with acute abdomen requiring surgical intervention.

Materials and Methods: This was a 3 years prospective hospital-based study of all neonates who underwent surgery for acute gastrointestinal emergencies at Chirayu Medical College and hospital Bhopal from January 2012 to January 2015. Patient’s profile, symptoms, causes of acute surgical abdomen, clinical outcomes were analyzed.

Results: A total of 25 neonates were studied, males were the majority being 18 (72.0%) Neonatal intestinal obstruction was the main abdominal surgical emergency. Anorectal malformation was seen in 12 (48%) cases. Abdominal distension was seen in 15 cases and failure to pass meconium was seen in 15 (19.2%) cases. Palliative surgery was done in 16 cases and definitive surgery was done in 9 cases. The mortality was seen in 5 neonates (20%).

Conclusion: In present study, Intestinal obstruction was the major cause of acute surgical abdominal emergency. There is a need to increase care at all levels of referral in our country for the early management of sick newborns. Facilities such as neonatal ventilators, specialized neonatal surgeon, and operative facilities will result in better outcome.

Keywords: Abdominal distension, Gastrointestinal emergencies, Neonatal surgery, Palliative surgery

INTRODUCTION

Surgical emergencies in neonates are usually congenital malformations. Intestinal obstruction in newborn is the most common newborn surgical emergency.1 The incidence of surgical emergency in neonate range from 1 to 4 per 100 births. It has been described that more than 80% of the infants with congenital anomalies, incompatible with life, but amenable to surgical correction, survive operation. In developed countries, the survival of surgical newborn has improved with time. The Medical Hospital at Chirayu Medical College is a tertiary care hospital in Bhopal region. It has a specialist surgeon, anesthetist, pediatrician, and neonatal intensive care unit services 24 h to tackle all emergencies. In a comparison of neonatal surgical admissions between two linked surgical departments in Africa and Europe, acquired surgical condition (necrotizing enterocolitis) was the most common surgical condition in the Europe hospital whereas a congenital condition (anorectal malformation [ARM]) was the most common surgical condition in the African hospital. The reason for this geographic difference is not readily explainable, but it may be linked to better antenatal diagnosis in Europe hospital.2 The worst prognosis in case of neonatal obstruction is seen when it leads to sepsis, bilious vomiting, perforation, and enterocolitis.3 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.4,5 The methods of treatment which are so effective in well fed babies in advanced countries, therefore have to be modified to suit local conditions. Post-operative

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management and nursing care is as important as operative skill for eventual recovery of neonates with such emergencies.

**MATERIALS AND METHODS**

This was a 3 years prospective hospital based study of all neonates (≤30 days old) who underwent surgery for acute gastrointestinal emergencies at Chirayu Medical College and Hospital Bhopal from January 2012 to January 2015. A detailed history was obtained from the patient parents, complaints with duration and their onset were recorded in each case, symptoms such as vomiting, frothy salivation trickling from angle of mouth, distension of abdomen either generalized, or in upper abdomen were asked. Patient had passed meconium and urine or not since birth and if meconium passed once, history of constipation was asked in each case, especially in case with gastrointestinal emergency child was passing meconium through a normal or abnormal opening was also recorded. The child was having spells of dyspnea and cyanosis off and on since birth or having any swelling on the back or in abdomen was asked. Some neonates had been with loops of intestine on the abdominal walls, came with this complaint only.

**Physical Examination**

Each neonate was examined in detail weight of neonate at the time of examination was recorded, irrespective of birth weight record. The presence of dyspnea and cyanosis (peripheral/central) noted Neonates were looked for sign of prematurity like underdeveloped ear cartilage and breast nodules and sole creases other than weight and gestation. Abdominal examination was done with special reference to presence of distension (generalized/localized) visible veins and visible loops of intestine, rigidity, and lump. Patient who came with respiratory distress, frothy salivation and catheters test for esophagus was positive, esophagogram was done to outline the esophageal atresia and tracheoesophageal. ARM, X-ray was done in Wengensken’s position and variety of ARM was classified. In cases of acute intestinal obstruction, scout film of abdomen was done.

**Treatment**

After making clinical diagnosis each case was treated on its own merits. Two basic line of treatment was adopted. Obvious diagnosis like ARM, trachea-esophageal fistula (TOF), palliative or definitive surgery was performed depending on the general condition of the patient. If diagnosis was not obvious, conservative line of management was adopted initially with intravenous fluid administration, nasogastric suction and appropriate antibiotics accordingly. They were later on subjected to exploratory laparotomy and the cause of obstruction was dealt with accordingly and other associated anomalies were also noted and treated.

**RESULTS**

Table 1 shows maximum neonatal 11 (44%) had weight between 2000 and 2500 g. 4 (16%) had > 2500 g wt. and 9 (36%) had the weight between 1500 and 2000 g.

In Table 2 it shows that 12 (48%) cases were ARM, 3 (12%) cases were of congenital megacolon and esophageal Atresia was seen in 2 (8%) cases.

In Table 3, it shows that overall 15 cases (19.2%). In this series had abdominal distension and complaints of failure to pass meconium. 8 (32%) patients had to vomit. Table 4 shows Xray findings of scout film abdomen.

Table 5 shows that out of total 25 case gastrostomy alone was performed in 2 cases. Sigmoid colostomy was done in 10 cases. Transverse colostomy was done in 3 cases.

Table 6 shows that ligation and division of TOF and end to end anastomosis was done in 2 cases in which general condition of patient was good. Resection and anastomosis was done in 2 cases. Duodenoduodenostomy was done in 1 case. Perforation repair was done in 2 cases.

Table 7 shows that mortality in surgical treated patients was (20%), i.e., 5 out of 25 patient treated surgically.

<table>
<thead>
<tr>
<th>Weight (g)</th>
<th>Number of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1500</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>1500-2000</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>2000-2500</td>
<td>11</td>
<td>44</td>
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<tr>
<td>&gt;2500</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100</td>
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</tbody>
</table>

<table>
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<tr>
<th>Emergency</th>
<th>Number of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARM</td>
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<td>48</td>
</tr>
<tr>
<td>Colonic and rectal atresia</td>
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<td>Ileal atresia</td>
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<td>4</td>
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<tr>
<td>Duodenal atresia</td>
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</tr>
<tr>
<td>Congenital megacolon</td>
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<td>12</td>
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<tr>
<td>Esophageal atresia</td>
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</tr>
<tr>
<td>Perforation</td>
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<td>8</td>
</tr>
<tr>
<td>Acute intestinal obstruction</td>
<td>02</td>
<td>8</td>
</tr>
<tr>
<td>Meconium ileus</td>
<td>01</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100</td>
</tr>
</tbody>
</table>

ARM: Anorectal malformation
**DISCUSSION**

Congenital abnormalities accounted for over 80% of all neonatal surgical conditions. This was similar to the findings in other studies. As in the present study, the most common surgical conditions in the newborn involve the gastrointestinal tract. The most common congenital abnormalities requiring surgical repair were ARM, small intestinal obstruction, neural tube defects and omphalocele, a finding similar to other studies. In our study, the imperforate anus was the most common cause of intestinal obstruction in neonates. Small bowel atresia was the second most common cause of intestinal obstruction. Colonic atresia was observed only in a single patient. Early presentation and early surgical intervention have an impact on the survival of these patients. In this study, gestational age was variable between 32 and 42 weeks and weight amongst 9 (36%) babies was between 1500 and 2000 g. State of maturity is an important determinant in neonatal surgical outcome. In our study, early presentation was observed among ARM, intestinal atresia and meconium ileus. Early onset of symptom and rapid deterioration of patient’s condition in intestinal atresia and meconium ileus and easy approach to diagnosis in ARM was probably the cause of early presentation. On the other hand, presentation was later in Hirschsprung’s disease and malrotation because of variability in onset of symptom and lack of specificity. In most developed countries, early diagnosis including prenatal diagnosis and planned delivery in a fully equipped pediatric surgical center has greatly improved survival in neonates. This is not so in our country where a majority of surgical neonates present very late. Moreover late presentation increased the mortality rate in children with intestinal obstruction. The most frequent causes of intestinal obstruction were ARM (48%), Hirschsprung’s disease (12%), meconium ileus (1%), intestinal atresia (12%) in this study. Nearly, similar observation was reported by Hanif et al. in their study and Ademuyiwa et al. in Nigeria. In present study, various modalities of management were used cases of high ARM were subjected to sigmoid colostomy 10 cases and anoplasty was done for two low ARM cases. Gastrostomy was done in 2 cases for pure esophageal atresia. Definitive surgery was done in remaining cases as resection and anastomosis was done for intestinal atresia cases. In our series, the mortality was 20%, in various studies authors have noted higher mortalities ranging from 30% to more than 42%, an Indian study proved that prolonged neonatal transport (>1 h) was found to increase the mortality among transported neonates. Infection was the most common post-operative complications and the most common cause of death as well just like in other studies. Babies delivered outside the hospital need to travel several hours to get to a specialist hospital that offers neonatal surgical services during which time the baby’s condition may deteriorate, leading to increased operative risk and mortality. Early recognition and immediate treatment of surgical conditions in the newborn infant is, therefore, very important.
CONCLUSION

Pediatrics surgery has evolved as a specialty within the province of general surgery, owing to the unique nature of the congenital anomalies seen in the newborn and to the awareness that physiological responses of body are both qualitatively and quantitatively different from the adult. Congenital anomalies that are incompatible with life unless they are corrected constitute the primary justification for this new specialty, because they demand experienced judgment in early diagnosis, expeditious management, as well as highly refined operative technique and post-operative care. Antenatal diagnosis with early referral, improved surgical skills and technologies, adequate staff and post-operative care as well as investments in developing neonatal surgery subspecialty are all required to reduce mortality and ensure a better outcome for surgical neonates in developing countries. Despite striking advances in pediatric surgery and pediatric anesthesiology the neonatal surgery remains the problem. Although many studies have been conducted in the part on the neonatal surgery, but the clinical study on this problem is lacking in Indian literature.

REFERENCES


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