



## Original Article

# Etiology and Treatment Outcome of Neonatal Intestinal Obstruction in a Tertiary Hospital

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### Abstract

A prospective study was conducted on 54 cases of neonatal intestinal obstruction, admitted in paediatric surgery department of Rajshahi Medical College Hospital during the period from January 2008 to December 2008, a period of 12 months. The objective of the study was to find out etiological aspect and outcome of admitted patient with neonatal intestinal obstruction. The patient constituted 33.7% of total neonatal admission in paediatric surgery department during the study period. The male: female ratio was 1.4:1 with age ranging from 1 to 28 days. Birth weight of most of the patients was above 2 kg. Most of the patients came from poor and average family. Patients from poor family are slightly ahead. Plain x-ray abdomen was done in all cases in our study. Contrast radiography performed in selected cases. Ultrasound scan done to in selective case to rule out IHPS. No rectal biopsy was taken incase of suspected Hirschsprung's disease.

The causes of neonatal intestinal obstruction were in order of frequency-Hirschsprung's disease (45.2%), Intestinal atresia (24.5%), Malrotation (9.4%), Bands & adhesion (5.6%), Meconium ileus (5.6%), Volvulus neonatarum (5.6%), Meconium plug syndrome (1.8%), Unknown (3.7%). 50 Patients were treated operatively. 28.3% cases developed complications. Most of the complications were related to colostomy and sepsis. Overall mortality was 20.8%. Mortality was maximum in intestinal atresia. Every patient was advised to come for follow up at the time of discharge but most of the people did not report. In the study only 17 (32.1%) patient came for follow up as per advice.

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### Introduction

Intestinal obstruction in the newborn may seem at first consideration to represent a rather a small segment of neonatal pathology. Yet it is responsible for most of the surgery in the neonatal period and for the most discouraging mortality figures of any neonatal surgical entities.<sup>1</sup> Neonatal intestinal obstruction has an approximate incidence of 1:2000 live births.<sup>2</sup> Causes of

neonatal intestinal obstruction are so many and its effect is also variable.

The morbidity and mortality of neonatal intestinal obstruction depends on type of obstruction, causes of obstruction, age of patient, duration of onset of disease, pre-maturity, general condition of the patient and associated congenital anomalies. Diagnostic delay, pre-operative preparation, operative technique and postoperative

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management can be the direct factors which contribute to high mortality rate.

In our country many factors can be added which increase the mortality rate. Ignorance, poor socioeconomic condition, bad communication system, lack of modern medical facilities in remote area shares the responsibility of higher mortality of intestinal obstruction.

Because of its serious nature it demands early diagnosis and relief by surgical treatment. The operative risk in all neonates with intestinal obstruction is great but in untreated patient with obstruction, the mortality is 100 percent.<sup>1</sup> Because neonates lack the reserve found in adult, many of the physiologic disturbances which result from mechanical intestinal obstruction become serious earlier. Delay in seeking surgical help may lead to resection of variable length of intestine, resulting in higher mortality rate and malabsorption syndrome. Untreated obstruction may lead to respiratory complication by splinting the diaphragm by abdominal distention and aspiration of vomitus, circulatory failure, metabolic acidosis, septicemia, gangrene and perforation of obstructed gut.

The present study has been done to find out etiological aspect and outcome of admitted patient with neonatal intestinal obstruction.

### Methodology

This is a prospective type of study conducted during January 2008 to December 2008 on 54 neonates admitted in paediatric surgery department of Rajshahi Medical college hospital with neonatal intestinal obstruction. Patients with anorectal malformation and Idiopathic Hypertrophic Pyloric Stenosis were not included in the study as they are considered as different entity. Cause of Neonatal intestinal obstruction was determined from history, clinical examination and peroperative findings. Outcome was considered in terms of morbidity and mortality.

### Results

The study consisted of 54 neonates which constituted 33.75% of neonatal admission in

paediatric surgery department of Rajshahi Medical College Hospital. The male: female ratio was 1.4: 1. The age of the patients in the study group ranged from 1day to 28 days. Majority of patient's age were below 7 days (35 patients) and least were found above 22 days (3 patients). The birth weight of these neonates in the overall group ranged from 1.6 kg to 4 kg. Birth weight of most of the patients was above 2kg. Mean birth weight was 2.5kg.

Out of 54 neonates with intestinal obstruction Hirschsprung's disease was the commonest cause found in 24(45.2%) neonates. Next most common cause was Intestinal Atresia which was found in 13 (24.5%) cases followed by obstruction due to malrotation, bands & adhesion, meconium ileus and volvulus neonatarum. In 2 (3.7%) patients no cause was identified because one patient expired before operation and in other case the parents did not give consent for surgery. Table-1 shows the causes of neonatal intestinal obstruction in study group.

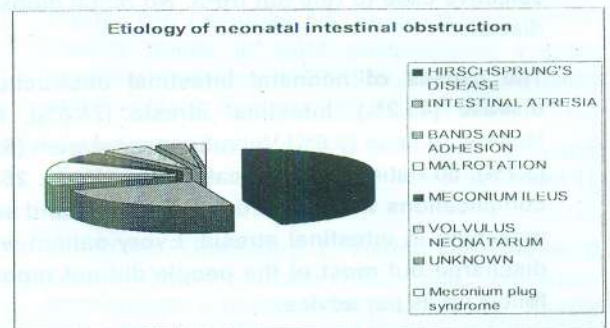


Fig-1: etiology of Neonatal intestinal obstruction

Hirschsprung's disease was the commonest cause of intestinal obstruction in neonates and accounts for 45.2% in our study. Diagnosis was done by clinical examination and radiology. Biopsy not done. 21 patients had short segment agangliosis involving the recto sigmoid part of large intestine. 3 had long segment Hirschsprung's disease. Intestinal atresia was the second most common cause (24.5%) of neonatal intestinal obstruction in our study. Intestinal atresia comprises 2 cases of duodenal atresia, 4 cases of jejunal atresia and 7 cases of ileal atresia. Both the cases of duodenal atresia were of type-I. Out of 4 cases of jejunal atresia 1 case was type-I, 2 cases were type-II and

1 case was type-IIIa. In ileal atresia 4 cases were type-IIIa and 3 cases were type-II.

After admission every neonate was carefully assessed. Proper history was taken from mother or attendant of the patient. Then the patient was examined thoroughly. Routine and if indicated special investigations were done. After admission all the patients were treated by nasogastric suction for decompression of stomach and intestine. Nothing was allowed by mouth. Intravenous fluid and par-enteral antibiotics were given.

Patient suffering from meconium plug syndrome was treated conservatively. It was treated by enema. Meconium plug was expelled after giving enema and thus obstruction was relieved

50 patients were treated operatively. Before operation pre-operative resuscitation was done. Vitamin -K was given intramuscularly. Blood transfusion was given per operatively in all the cases.

Parents of one patient did not give consent for operation and one patient died before operation.

Operative procedure done in duodenal atresia- one patient was treated by excision of septum and duodenoplasty, the other patient was treated by duodeno-duodenostomy.

In jejunal atresia-one patient was treated by removal of septum and rest of the patient were treated by resection of proximal dilated jejunum and atretic part and end to end anastomosis.

Resection of proximal dilated part and atretic part and end to end anastomosis were done in 5 cases of ileal atresia. Ileostomy was done in 2 cases.

In meconium ileus resection of meconium containing ileum and end to end anastomosis was done.

Obstruction was relieved by excision of bands and release of adhesion in 3 cases. Ladd's procedure was done in 4 cases.

In Hirschsprung's disease, Ileostomy was done in 3 cases of long segment Hirschsprung's disease. In short segment Hirschsprung's disease transverse colostomy was done in 16 cases and single stage

pull through operation done in 5 cases. In volvulus neonatarum the operation consists of reduction by untwisting of the volvulus.

Post-operatively all the patients were treated by intravenous fluid, nasogastric suction and parenteral antibiotic. Patient was kept nothing per oral until bowel sound returns or bowel is moved.

Every patient was advised to come for follow up at the time of discharge but most of the people did not report. In the study only 17 (32.1%) patient came for follow up as per advice. Among them 4 (23.5%) patient had colostomy prolapse. All the patients were managed accordingly.

After operation, 15 (28.3%) patients developed complications. The complications are summarized in table-2.

Out of 53 patients, 11(20.8%) died. As there are no autopsy facilities, the exact cause of death could not be ascertained. Mortality was maximum in intestinal atresia. Table -3 shows distribution of disease in case of mortality

**Table 2 :** Complication of neonatal intestinal obstruction

Complications	Number of patient
Septicemia	4
Colostomy Prolapse	4
Respiratory problem	3
Wound infection	3
Anastomotic leakage	1

**Table 3 :** Distribution of disease in case of mortality

Disease	No of pt
Intestinal atresia	6
Malrotation	2
Bands and adhesion	1
Meconium ileus	1
Volvulus neonatarum	1

## Discussion

There were 54 neonates with neonatal intestinal obstruction in 12 months of study period which accounts for 33.75% total neonatal admission in paediatric surgery department. This study suggests that there is an increase in the incidence of neonatal intestinal obstruction in our hospital in

comparison to other studies.<sup>3,5</sup> This increase may indicate-

Most of these neonates are presenting to tertiary centers for appropriate treatment. This is a deviation from previous report<sup>4</sup> where resource deficiency and ignorance compelled parents to seek treatment for their children in an inappropriate place. Improvement of socioeconomic status and educational campaign may have contributed to this trend.

The problem may be more common in our country. Due to large population the incidence is higher in our country.

In our study there were 31(58.5%) males and 22 (41.5%) females. The male: female ratio was 1.4: 1. The male predominance was almost similar to other study.<sup>5</sup> Males are more cared in our society and this may be one of the causes of male predominance.

The birth weight of 53 neonates in the present study was varied from 1.6kg to 4kg. Majority of the patients were between 2-2.5 kg. Mean birth weight was 2.5kg which was similar with the study of Lormier. But mean weight in the study conducted in Taiwan was 3.2kg.<sup>6</sup> This difference is probably due to average birth weight in Taiwan is higher than that of our country. Most of the families in our country were poor and majority of the mother were from malnutrition and anaemia.

The age of the patients in the study group ranged from 1day to 28 days. Majority of patient's age were below 7 days (35 patients) and least were found above 22 days (3 patients). The late presentation increased both mortality and morbidity. It is one of the factors responsible for poor outcome of neonatal intestinal obstruction in developing countries.<sup>4,6</sup> Efforts are needed to ensure early presentation. As most of the babies are delivered at home in our country no careful examination is carried out. Most of the neonates with late presentation of the present study came from poor families. Their parents were not able to spend money for their treatment. Early presentation of neonatal intestinal obstruction

needs to be emphasized and equally the healthcare workers need to be educated on early recognition of Neonatal intestinal obstruction. Close liaison between primary, secondary and tertiary healthcare facilities as well as readily available patient transfer facilities are equally indispensable. A report from United Kingdom<sup>7</sup> indicated that these measures, among with other factors, will provide good outcome.

Out of 54 neonates with intestinal obstruction Hirschsprung's disease was the commonest cause found in 24(45.2%) neonates. This result varies from the study conducted at Bangladesh Institute of Child Health<sup>8</sup> where the commonest cause was intestinal atresia. The probable reason may be due to high incidence of Hirschsprung's disease in this region of the country. The sex distribution favours the male as expected. The male: female ratio in our series was 2:1. 21 patients (87.5%) had short segment agangliosis involving the recto sigmoid part of large intestine. 3 (12.5%) had long segment Hirschsprung's disease. This result corresponds with that of Ikeda and Goto (1984) through their analysis of 1628 patients of Hirschsprung's disease in Japan. Most neonates with Hirschsprung's disease had birth weight above 2.5 kg which is similar with the findings of previous study.<sup>9</sup> No rectal biopsy was taken. Diagnosis was done by clinical examination and radiology.

Intestinal atresia was the second most common (24.5%) cause of Neonatal intestinal obstruction in our study. This differs from the study at Bangladesh Institute of child Health.<sup>9</sup> In their study intestinal atresia was the commonest cause of Neonatal intestinal obstruction. In their study 9.1% were duodenal, 36.4% were jejunal and 54.5% were ileal atresia. In our study 15.4% were duodenal, 30.4% were jejunal and 53.8% were ileal atresia. The ratio of jejuno-ileal to duodenal atresia in Nixon and Tawes study<sup>11</sup> was 2:1 but the ratio was higher (5.5:1) in our study. Ileum was more commonly affected than jejunum which was similar to other studies.<sup>11</sup>

Post-operative complications developed in 15(28.3%) patients. Major complications were

related to colostomy and sepsis. Similar complications have been reported in some studies from other developing<sup>4,6</sup> and developed countries<sup>8,10</sup> and may indicate that improved facilities could only minimize but not completely obviate these complications.

Mortality rate in our study was 20.8% which was similar with the report of Dr. Md. Rezaul Islam.<sup>9</sup> But the mortality is lower than study (32%) of University of Nigeria.<sup>11</sup> Nevertheless, this still a far cry from the survival rates of 87-93% reported from some developed countries.<sup>11,12</sup> This discrepancy may reflect lack of facilities, resource deficiency, lack of neonatal intensive care unit and ignorance. Collaboration between the developed and less developed parts of the world could significantly improve outcome.

### Limitation of the study

Our study findings were limited by incomplete data on gestational age at delivery. As Hirschsprung's disease was not confirmed by rectal biopsy, it could play a role in high incidence of the disease.

### Conclusion

This study was carried out in Paediatric Surgery Department of Rajshahi Medical College Hospital during January 2008 to December 2008. A total of 54 neonates with intestinal obstruction were studied. Neonatal intestinal obstruction is not uncommon in our country. It is one of the major causes of mortality and morbidity among neonatal surgical patients. Late presentation, delay in seeking medical treatment, poor socio economic condition is significant factors for increased morbidity and mortality. The problems are compound by ignorance, superstition and fear. Mass health education in the context of our country is necessary to eliminate this problem. No definite etiological factors could be identified. Extensive research work must be needed to identify the definite etiological factors.

Improved antenatal and postnatal care, prompt diagnosis and proper perioperative measures are

necessary to reduce the mortality and morbidity. Fluid balance and maintenance of body temperature in neonates is very vital. Intensive care unit plays a great role in reducing morbidity and mortality. Anaesthesia in neonates should be conducted by expert personnel for better outcome in this age group. Separate well equipped neonatal surgical unit should be established in paediatric surgical department for better prognosis of neonatal surgical patients.

This study tried to collect information about the etiology and treatment outcome of neonatal intestinal obstruction. It is hoped that organization and compilation of this information will encourage other for further studies, leading to a greater comprehension of the problems of neonatal intestinal obstruction in our country and thus plan can be made to remove the problems with our available resources and to improve the quality of life.

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