

# Neonatal Intestinal Obstruction in Aba Nigeria

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## To cite this article:

Samuel Chidi Ekpemo, Nneka Okoronkwo. Neonatal Intestinal Obstruction in Aba Nigeria. *European Journal of Clinical and Biomedical Sciences*. Vol. 4, No. 6, 2018, pp. 69-72. doi: 10.11648/j.ejcb.20180406.11

**Received:** December 18, 2018; **Accepted:** December 29, 2018; **Published:** January 22, 2019

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**Abstract:** Background: Intestinal obstruction in the neonate is a common indication for neonatal emergency surgery. Failure to pass meconium by a full-term neonate within the first 24 hours of life should raise a suspicion of bowel obstruction. The objective of this study was to determine pattern of presentation, diagnosis and outcome of management of intestinal obstruction in the neonates at the Abia State University Teaching Hospital Aba. Methodology: A Prospective study of fifty-four neonates who presented with clinical and radiological findings consistent with intestinal obstruction that was treated at Paediatric Surgical unit, Department of Surgery, of the Abia State University Teaching Hospital Aba between October 2016 to October 2018. Proforma was opened for sex, weight, age at presentation, clinical presentation, duration of symptoms prior to presentation, surgical pathology, treatment offered, complications and management outcome Results: During the twenty-five months period, Eight hundred babies were admitted at the special care baby unit of the hospital. Fifty-four babies (6.75%) of these were cases of neonatal intestinal obstruction. There were 40 males and 14 females, with male to female ratio of 4:1. The mean weight of the neonates was 2.5kg (range 1.1-4.3kg). The average age at operation was 3 days (1-15days), the mean duration of symptoms before presentation was 3.5days. The major indication for operation was Anorectal malformation 32 patients {59.3%}, Hirschsprung's disease 10 {18.5%}, Intestinal atresia 8 patients {14.8%}, obstructed hernia 4 patients {7.4%}. Conclusion: The morbidity and mortality of neonatal intestinal obstruction in this hospital is due to the problems of late presentation and poor neonatal intensive care facilities. The findings are at variance with those in developed countries.

**Keywords:** Neonates, Intestinal, Obstruction

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## 1. Introduction

Intestinal obstruction in the neonate is a common indication for neonatal emergency surgery. Failure to pass meconium by a full-term neonate within the first 24 hours of life should raise a suspicion of bowel obstruction. Successful management of neonatal intestinal obstruction depends on timely diagnosis and referral for therapy. The diagnosis is based on history (symptoms) and physical examination (signs) confirmed by some investigations such as radiographic and histopathological studies. Catastrophic events such as volvulus, ischaemic loop of bowel, pneumoperitoneum, and/or pneumonia from aspiration and malnutrition could be overcome through efficient and timely resuscitation and urgent transport to a specialized unit. The commonest reported causes of bowel obstruction in decreasing order includes anorectal malformations, duodenal atresia, jejunoileal atresia,

Hirschsprung's disease, meconium ileus and meconium plug syndrome [1]. Other neonatal medical conditions like hypothyroidism, hypokalemia, sepsis and congestive heart failure are also reported to cause bowel obstruction. Although reports in developing countries are few, available evidence showed that neonates in African countries often do not get definitive medical care for several days. The desired goal of healthy survival of neonatal intestinal obstruction requires a coordinated interaction of medical, nursing, and rehabilitative specialties in an organised team. Early surgical intervention is paramount and may mean all the difference between intestinal salvage and crippling short gut syndrome. The typical case of neonatal bowel obstruction is generally straightforward, and the outcome is potentially excellent. Samuel et al [2], in Aba, Nigeria emphasized problems of late presentation and poor neonatal ICU care facilities. The purpose of this study is to review the pattern of intestinal obstruction in the early postnatal period, its associated complications and outcome of

management in order to determine factors associated with death of these newborns in the Abia State University Teaching Hospital Aba.

## 2. Methodology

The study was conducted at the neonatal intensive care unit (NICU) of Abia State University Teaching Hospital Aba which is the main neonatal care center in Aba, South East Nigeria. Abia State University Teaching hospital is the tertiary university teaching hospital located in the commercial city of Aba, where all neonatal intestinal obstruction cases are referred to. Cases under the age of one month were admitted to the unit, as it is the unit's protocol since its establishment. Admission of cases is done after consulting the Pediatric Surgery Department in conjunction with the Neonatology team. A Prospective study of fifty-four neonates who presented with clinical and radiological findings consistent with intestinal obstruction, that was treated at Paediatric Surgical unit, Department of Surgery, of the Abia State University Teaching Hospital Aba from October 2016 to October 2018. Proforma was opened for sex, weight, age at presentation, duration of symptoms prior to presentation, clinical presentation, surgical pathology, treatment offered, complications and management outcome. All the patients were operated upon by the consultant. The primary outcome measure was taken to be discharge or death after management, while secondary outcome measures were various complications occurring after surgical operations. Data was analyzed using statistical package of social sciences (SPSS7.0) as proportions and percentages.

## 3. Results

### 3.1. Demography

During the twenty-five months period, Eight hundred babies were admitted at the special care baby unit of the hospital. Fifty-four babies (6.75%) of these were cases of neonatal intestinal obstruction. There were 40 males and 14 females, with male to female ratio of 4:1. The mean weight of the neonates was 2.5kg (range 1.1-4.3kg). The average age at operation was 3 days (1-15days), the mean duration of symptoms before presentation was 3.5days.

### 3.2. Clinical Presentation

Table 1. Clinical features.

| Clinical features                     | Frequency | Percentage |
|---------------------------------------|-----------|------------|
| Abdominal distension                  | 54        | 100        |
| Vomiting                              | 40        | 74         |
| Failure to pass meconium              | 42        | 77         |
| Respiratory compromise                | 30        | 55         |
| Hyperaemia of anterior abdominal wall | 20        | 37         |

Clinical presentation included abdominal distension, vomiting, failure to pass meconium, respiratory compromise and hyperaemia of the anterior abdominal wall.

### 3.3. Diagnosis

The combination of clinical and radiological assessment was required for diagnosis of intestinal obstruction in the majority of cases, The classical plain radiological features of multiple air-fluid levels, bowel distension, absent rectal gas, gasless lower abdomen were diagnostic and suggestive of the sites of obstruction in 22 (40%) neonates. Hirschsprung's disease required rectal biopsy and histopathological confirmation. Anorectal malformation had cross table lateral decubitus radiograph which help to classify the anomaly into low and high anorectal malformation. Haematocrit result appeared to be within normal range in all neonates. Urea and electrolytes were deranged in 30 (55%) neonates which required pre-operative corrections.

### 3.4. Indications for Surgery

The major indication for operation was anorectal malformation 32 patients {59.3%}, Hirschsprung's disease 10 {18.5%}, Intestinal atresia 8 patients{14.8%}, obstructed hernia 4 patients{7.4%}.

Table 2. Indications for Surgery.

| Indications            | Number of patients | Percentage |
|------------------------|--------------------|------------|
| Anorectal malformation | 32                 | 59.3%      |
| Hirschsprung's disease | 10                 | 18.5%      |
| Intestinal atresia     | 8                  | 14.8%      |
| Obstructed hernia      | 4                  | 7.4%       |

### 3.5. Surgical Procedure

The type of operative procedure carried out and associated mortality are shown in Table 2. Colostomy fashioning was the commonest procedure performed in 32 (33%) of the patients for high anorectal malformation and Hirschsprungs disease followed by anoplasty for low anorectal malformation in 10 patients as shown in Table 2.

Table 3. Surgical Procedure done.

| Procedure         | Number of patients | Percentage |
|-------------------|--------------------|------------|
| Colostomy         | 32                 |            |
| Anoplasty         | 10                 |            |
| Repair of atresia | 8                  |            |
| Herniotomy        | 6                  |            |

### 3.6. Complications

During a mean follow up of 3months {1week to 9months} procedure related complications occur in 12 patients (22.2%) Infective conditions (peristoma excoriation, surgical site infection, wound breakdown) accounted for the greater number of morbidity (n=10, 83%), followed by anaesthesia-related complications (n=2, 17%) as shown in Table 3.

Table 4. Complications.

| Complications           | Number of patients |
|-------------------------|--------------------|
| Peristomal excoriation  | 6                  |
| Surgical site infection | 2                  |
| Wound breakdown         | 2                  |
| Anaesthesia related     | 2                  |

### 3.7. Mortality

Six patients died {mortality of {11.1%}. The following factors contributed to mortality (age at presentation, the body weight and gestational age). However, the non-survivors had a longer delay before presentation (>48hours), lower body weight (<2 kg) and gestational age <38weeks as shown in table 4.

**Table 5.** Comparison of mortality with various outcome variables.

|                          | Number of patients | Mortality | Percentage |
|--------------------------|--------------------|-----------|------------|
| Presentation in Hrs      |                    |           |            |
| <48                      | 20                 | 1         | 5%         |
| >48                      | 34                 | 4         | 14.7%      |
| Gestational age in weeks |                    |           |            |
| <38                      | 30                 | 5         | 16.6%      |
| >38                      | 24                 | 1         | 4%         |
| Weight {kg}              |                    |           |            |
| <2                       | 22                 | 4         | 18%        |
| >2                       | 32                 | 2         | 6%         |

## 4. Discussion

Neonatal intestinal obstruction (NIO) is one of the most common emergency conditions a paediatric surgeon is called upon to assess during the neonatal period. Successful management of NIO depends on timely diagnosis and referral for therapy. The diagnosis is based on history (symptoms) and physical examination (signs) confirmed by some investigations such as radiographic and histopathological studies. Catastrophic events such as volvulus, ischaemic loop of bowel, pneumoperitoneum, and/or pneumonia from aspiration and malnutrition could be overcome through efficient and timely resuscitation and urgent transport to a specialised unit. Intestinal obstruction can be complete (atresia, anorectal malformation (ARM)) or incomplete (stenosis, web). Obstruction may be intraluminal (meconium ileus or meconium plug syndrome) or functional (Hirschsprung's disease (HD)). Proximal obstruction presents with earlier vomiting and less abdominal distention, whereas distal bowel obstruction lends itself to late emesis and greater abdominal distention.

The commonest cause of neonatal intestinal obstruction in this report is anorectal malformations (59.3%) followed by Hirschsprung's disease, similar findings was noted by Ameh et al [3] and Momoh et al [4] in their series at the Zaria Northern Nigeria. These findings are in contrast to those from Ile-Ife, western Nigeria [5] where anorectal malformation, intestinal atresia, Hirschsprung's disease and midgut volvulus respectively in that order are the common causes. However, in Lagos, western Nigeria [6] hypertrophic pyloric stenosis, intestinal atresia and anorectal malformation are the common causes. In a report from North America [7], Hirschsprung's disease was the second most common cause of neonatal intestinal obstruction after necrotising enterocolitis. While in developed countries the diagnosis of Hirschsprung's disease is being increasingly made in the neonatal period [8], the reverse is the situation in Zaria, where the proportion of these patients presenting in the neonatal period has fallen from

56% [1] to 20% as reported by Ameh and co-workers. In developed countries, intestinal atresia is a common cause of congenital intestinal obstruction (7-8) and accounted for one-third of causes of neonatal intestinal obstructions in one report [8]. However, intestinal atresia accounted for 14.8% in this series while in Zaria, however, only 6.7% of cases of neonatal intestinal obstruction are due to intestinal atresias.

The median age at presentation in this report was three days, and patients with intestinal obstruction presented particularly late. This is similar to other reports from Nigeria (2-5). Clinical presentation included abdominal distension, vomiting, failure to pass meconium, respiratory compromise and hyperaemia of the anterior abdominal wall which is similar to findings reported by Osifo et al in Benin Nigeria. Most of our patients had frank features of intestinal obstruction and required only plain abdominal radiographs and cross-table lateral radiographs or invertogram for diagnosis. Barium enema was helpful in patients with Hirschsprung's disease without peritoneal signs. Plain supine and erect abdominal radiographs are frequently the only investigations necessary for the confirmation of intestinal obstruction in neonates (11-13), contrast studies being reserved for diagnostic difficulties, and then in the absence of acute peritoneal findings.

Colostomy fashioning was the commonest procedure performed in 32 (33%) of the patients for high anorectal malformation and Hirschsprung's disease followed by anoplasty for low anorectal malformation in 10 patients in this series as shown in Table 2. Similarly, Mustefa Mohammed and co-workers [1] in Ethiopia Surgery performed Colostomy, anoplasty, resection with end-to-end anastomosis were done in 34 cases (66.7%), 1 (2%) and 12 (23.5%) of the cases, respectively in their series. Modern supportive care in the intensive care unit (ICU) with continuing fluid resuscitation, parenteral nutrition, and respiratory support have been the bases for the increased survival rate. In countries where parenteral nutrition is not available, trans-anastomotic tubes have been tried with indefinite success for the purpose of early feeding. This postoperative management will make all the difference to the survival of neonates in Africa.

The overall morbidity in this report was 17%, mostly (69%) from colostomy due to peristoma excoriation. Sepsis is a common complication in surgical neonates due to immature immune system, malnutrition, invasive procedures and late presentation increases the risk of sepsis. 83% of our patients had infective conditions, which accounted for the greatest number of morbidities (Table 4). Sowande et al [10] noted that Sepsis the most common complication and had the worst outcome, followed closely by respiratory and bleeding problems. This agrees with the series reported by Ameh et al [11]. In addition, may be because most of these patients were never resuscitated adequately from the referring hospital, coupled with the poor transportation condition they were subjected to.

The efficacy of most antibiotics available in many developing countries like ours cannot be assured and may

contribute to the nonresponse to treatment in some of the patients Osifo and Oveni [12] recorded 53% of established sepsis in neonates presenting for neonatal surgery in their centre. However, 45% of neonatal surgeries in Nnewi [13] Nigeria had documented infective conditions. The mortality of 11% in this series which is lower compared to 21% and 47% reported in Zaria by Ameh and Momoh respectively and 44.6% and 33% respectively (2, 3) from other parts of Nigeria [16]. The reduction in mortality in this report may be due to meticulous resuscitation and collaboration with neonatologist. The problems of lack of facilities for neonatal intensive care and total parenteral nutrition however remain. This is in contrast to developed countries where mortality from the common causes of neonatal intestinal obstruction has reduced (5, 8, 15, 17), mostly due to earlier presentation and availability of improved neonatal support facilities. It is hoped that the outcome in our environment will improve further as facilities improve and more patients present early.

## 5. Conclusion

The etiology, mode of presentation morbidity and outcome of treatment of intestinal obstruction in neonates in this study were not significantly different from other results in the sub-region. The mortality of neonatal intestinal obstruction in this hospital is due to the problems of late presentation and poor neonatal intensive care facilities. The findings are at variance with those in developed countries. Health education during antenatal visits and health insurance will help to reduce late presentation. Advocacy to the government on the need of upgrading of facilities and training of workers will enhance the overall outcome.

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