Original Article

Acute Intestinal Obstruction: A 1-Year Prospective Audit into Causes

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Abstract

Background: Intestinal obstruction is a common general surgical emergency with high morbidity and mortality. Its aetiology varies widely between and within geographic regions, with gender, age, and time. Obstructed inguinal hernia is still considered the most common cause of intestinal obstruction in Sub-Saharan Africa and other low-income countries, but its incidence appears to be on the decrease as other causes of intestinal obstruction become more common in a particular society. **Aim:** To examine the spectrum of causes of intestinal obstruction in a tertiary hospital in southern Nigeria and compare the results with earlier studies in the region and Nigeria. **Materials and Methods:** A cross sectional, single-hospital study of adults diagnosed with and having clinical and radiological features of acute intestinal obstruction. **Results:** Seventy patients were enrolled in the study, comprising of 35 (50%) males and 35 (50%) females, M:F = 1:1. The mean patient age was 44.8 years. Two peak age incidences of intestinal obstruction were observed in the 36–45 and 56–65 years age groups. Post-operative adhesion 13 (18.5%), obstructed external abdominal hernia 13 (18.5%), colonic cancer 11 (16%), and intussusception seven (10%) were the primary causes of intestinal obstruction. Obstructed inguinal hernia was commonly encountered in males while adhesions and colonic cancers were common in females. **Conclusion:** Obstructed external abdominal hernias and post-operative adhesion are at par as the main primary causes of intestinal obstruction. Colon cancer and intussusception are increasingly causing more obstructions.

Keywords: *Aetiology, gender, geographic variation, intestinal obstruction*

Introduction

Intestinal obstruction is the failure of distal transmission of intestinal contents which could be mechanical or functional.[1] It is a common presentation to the general surgeon and may require urgent surgery to relieve the cause of obstruction and obviate preventable morbidity and mortality. Its cardinal presentations are abdominal pain, distension, vomiting, and inability to pass stool or flatus[2]; the predominant presentation depending on the type and level of the obstruction. Intestinal ischaemia/strangulation, sepsis, and metabolic derangements all increase the mortality which is determined by the pathological type of obstruction.

The aetiology of intestinal obstruction varies widely between and within geographic regions, gender, and age. The aetiology evolves over time within regions. Earlier studies in Nigeria identified obstructed external hernias, inguinal in particular,[3] as the predominant cause of intestinal obstruction whereas adhesion was common in the developed economies. Recent studies in Nigeria and the West African sub-region show an evolution in the cause of intestinal obstruction with the pattern nearly reflecting the Western disease.[4,5] This poses particular challenge in the specific cases of adhesion and large bowel tumours; adhesion being best prevented at the primary surgery whereas facilities for screening, diagnosis, and treatment of large bowel tumours are tenuous or absent in many settings in the developing world.

Periodic audit and documentation of the causes of intestinal obstruction provides information on the evolution of the condition and may determine the ease of diagnosis. This study will provide a baseline for the causes of intestinal obstruction in our institution against which later studies on the subject will be compared to determine a trend. The findings of this study will be compared with recent studies in the sub-region.

Setting

A general surgery unit in a 500-bed tertiary health facility providing emergency general surgery services in southern Nigeria.

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Type of study

A cross sectional descriptive, single-hospital study in a general surgery unit, over 1 year, in a tertiary health institution.

Inclusion criteria

Consecutive adults, 18 years and older presenting in the emergency room over 1 year and having a clinical and radiological diagnosis of intestinal obstruction.

Exclusion criteria

Patients who were diagnosed with intestinal obstruction but observed for less than 6 hours in the emergency room before self-discharge.

Ethical approval

Approval (UUTH/AD/S/VOL.XXI/559) for the conduct of this study was obtained from the Institutional Health Research Ethics Committee (IHREC).

Materials and Methods

Consecutive patients presenting at the emergency room with features of intestinal obstruction (abdominal pain, distension, vomiting, and inability to pass stool and a plain abdominal X-ray findings of multiple air-fluid levels or intestinal dilatation) were recruited over a one-year period. Each patient had his/or her biodata, predominant clinical features, clinical diagnosis/intraoperative, and radiological diagnosis captured in a case report form.

A minimum of full blood count, urine analysis, erect, and supine plain abdominal X-ray was done for each patient. They were resuscitated and either managed conservatively and discharged to continue on out-patient care if symptoms completely resolved or underwent surgical treatment.

Data analysis

Analysis was done with SPSS 17.0 (SPSS Inc., Chicago, Illinois) using descriptive statistics and presented as percentages in tables.

Results

Seventy patients were recruited in the study, 35 male patients (50%) and 35 female patients (50%), M:F = 1:1. The mean age was 44.83 ± 15.38 years. Two peak age incidences of intestinal obstruction occurred in the 36–45 and 56–65 years age groups, each having 15 cases [Table 1]. Adhesion 13 (18.5%), obstructed external abdominal hernia 13 (18.5%), colonic cancer 11 (16.0%), and intussusception seven (10.0%) were the primary causes of intestinal obstruction [Table 1]. In eight (11%) patients, a specific diagnosis was not made as symptoms resolved spontaneously on observation. Less significant causes of intestinal obstruction were obstructed femoral hernia (2), appendix mass (2), peritonitis (2), ileus (2), abdominal tuberculosis (1), small intestinal malrotation (1), and tubo-ovarian mass (3).

Table 1: Causes of adult intestinal obstruction in a tertiary health facility in southern Nigeria

Aetiology	Males	Females	Total (%)
Adhesions	4	9	13 (18.6)
Obstructed external hernia	10	3	13 (18.6)
Colon cancer	4	7	11 (16.0)
Intussusception	4	3	7 (10.0)
Volvulus	2	1	3 (4.3)
Non-specific	5	3	8 (11.4)
Others	6	9	15 (21.4)

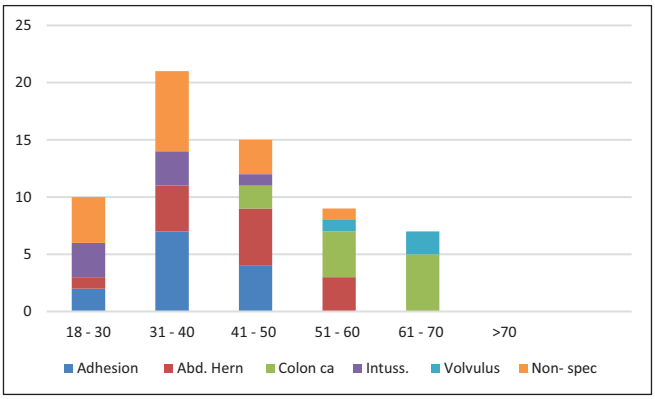

Figure 1: Distribution of the causes of intestinal obstruction showing an age-related trend

Adhesion (9) and colon cancer (7) were more common in female patients whereas obstructed inguinal hernia (9 cases), intussusception (4), and sigmoid volvulus (2) were more common in male patients. Obstructed incisional, umbilical, and para-umbilical hernias were more common in females. A specific diagnosis could not be made in eight patients (11.4%) who presented with classical clinical and radiological features of intestinal obstruction which resolved spontaneously while being resuscitated.

Discussion

This study shows obstructed external abdominal wall hernias, post-operative adhesions, and colonic tumours as the principal causes of intestinal obstruction in Uyo. Intussusception and sigmoid volvulus were less common. Female patients accounted for half the number of patients. The young age group was particularly affected by the disease. Variations in the incidence of individual causes of intestinal obstruction from earlier studies in our region of Nigeria was in the proportion of the principal causes excepting colonic tumours and intussusception which are unusually increased.[3,4] We also observed an age-related trend in the major causes of intestinal obstruction, with increasing incidence of abdominal wall hernias up to the fourth decade and a slight decrease in the fifth, adhesion

occurring maximally in the third decade and showing a drop in the fourth and colon cancer occurring in the fifth and sixth decades of life [Figure 1].

Obstructed abdominal wall hernias in both genders was common with male patients having a predominance of inguinal hernias whereas female patients had a varied distribution of obstructed inguinal, umbilical, epigastric, and incisional hernias. The patients' history often suggested these hernias are not recent; some had experienced recurrent symptoms of obstruction over varying periods but failed to seek medical attention. Abdominal wall hernias are common in the West African sub-region; they are often complicated because of low repair rates.[6] Obstructed external abdominal wall hernias, inguinal in particular among males, have been shown by generation of researchers in our region to be the commonest cause of intestinal obstruction. Otu[1], Efem[7], and Ngim[8] researched on the aetiology of intestinal obstruction in Calabar, south eastern Nigeria and found obstructed inguinal hernias to be the commonest cause of intestinal obstruction. The studies by Otu and Efem were a case mix of paediatrics and adults, with a significant proportion of the hernias occurring in children. Madziga[9] in a retrospective case mix study in north eastern Nigeria, as well as Tamijmarane[10] and Deshmukh[11] in India also found obstructed external abdominal wall hernias as the common cause of intestinal obstruction.

The increase in external abdominal hernia repair rate in Nigeria, especially through free medical outreaches in rural and semi-rural communities[12] may partly account for our observation of a reduction in the proportion of external abdominal wall hernias causing intestinal obstruction. However, with the increased rate of hernia operations, we see an increased presentation with recurrent hernias in our practice. This may be the consequence of the repair techniques used; suture repair is the most common locally and are often done under tension which may explain these recurrences.[13,14]

Adhesion was at par with obstructed external hernia as a cause of intestinal obstruction in our study with the trend showing a slow increase to peak in the third decade of life and a drop in the fourth, reflecting the frequency of abdominal or pelvic procedures in female patients at this age interval. Adhesion was predominantly a disease of young women [Table 1] who previously underwent an open abdominal or pelvic procedure. Adhesions are the consequence of mesothelial injury occurring during abdominal surgery,[15] leading to fibrous scar formation which cause adherence of loops of the intestines to one another, to omentum, the peritoneal lining, and the scar on the abdominal wall. They occur to varying degrees in all abdominal procedures.

Adesukanmi,[4] Oladele,[16] and Lawal *et al.*[17] working in south western Nigeria had observed post-operative adhesion to be the most common cause of intestinal obstruction more than a decade ago. This simulates the pattern of intestinal obstruction seen in Western countries[18] where it may account for up to 75% of intestinal obstruction and carries the implication of increased surgical load and cost from chronic abdominal pain, infertility,[19] and adhesiolysis, a procedure which is time consuming and strongly associated with an increased risk for iatrogenic bowel injuries. Considering the local studies with similar trend,[20,21] we anticipate adhesion will become the primary cause of intestinal obstruction in most regions of Nigeria and sub-Saharan Africa in the near future.

Colonic and rectal cancer is worryingly emerging as an important cause of intestinal obstruction in our practice, affecting more women than men from the fifth to sixth decades of life. The primary challenge with these subset of patients is presentation with metastasis and other co-morbidities, culminating in increased morbidity or mortality. The incidence of colonic malignancies is reported by researchers in Nigeria to be increasing, particularly in the last decade.[22,23] The disease is common in the fourth of life and is often attributed to the Westernization of our diet and poor meat and other food processing methods.[24] Colon and rectal cancer generally present late; often with metastases and intestinal obstruction because of lack of specific diagnostic and therapeutic facilities. Screening is an effective way of controlling colon and rectal cancers and there is a strong need to commence population screening for this disease in Nigeria now that the incidence of the disease is increasing.[25]

Other identified causes of intestinal obstruction in our series include sigmoid volvulus, intussusception, and tuberculosis. Sigmoid volvulus was previously considered a rare cause of intestinal obstruction in south eastern Nigeria[3] but we are currently encountering more of the disease in elderly males and clinical diagnosis is usually easy although the incidence of strangulation is high because of late presentation. Volvulus is however reported to be the commonest cause of intestinal obstruction in some environments.[26,27] Intussusception in adults is not so rare in our practice; it is common among the young and its diagnosis is often delayed and made intra-operatively,[28] increasing the risk of being complicated at diagnosis. Obstruction from tuberculosis is equally very rare but there reports from Pakistan which show it to be the most common cause of intestinal obstruction.[29]

We encountered cases presenting with the classical clinical and radiological features of intestinal obstruction but with no specific diagnosis and in whom there was a spontaneous resolution of the symptoms during resuscitation. These cases were considered to have pathologies that may be rare or can present with transient episodes of intestinal

obstruction and we have been following them up. Thus far, two have re-presented with same symptoms and undergone exploration with intraoperative diagnoses of obstructed left paraduodenal hernia and obstruction from primary small intestinal lymphoma. These cases were not detected at first presentation because abdominal computed tomography scan was not done, and we currently incorporate this imaging modality in the management of non-specific abdominal pain.

Limitations

The small number of patients in this study and that some of the studies we compared our results with involving a mix of paediatrics and adult patients limit the conclusions that can be drawn. A national multi-institutional or international pan-African collaborative studies are desired to make better conclusions.

Conclusion

The aetiology of intestinal obstruction in Uyo is evolving towards that seen in western Nigeria and Western countries where adhesion and colonic tumours predominate. A continuation of this trend will likely redefine the scope of work for the general surgeon in the near future.

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Conflicts of interest

There are no conflicts of interest.

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