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INTESTINAL OBSTRUCTION IN THE PEDIATRIC AGE GROUP AT MOI TEACHING AND REFERRAL HOSPITAL, KENYA

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ABSTRACT

Background: Intestinal obstruction is the commonest life-threatening emergency all around the world requiring emergency management. It occurs when there is interruption in the forward flow of the intestinal contents. It is a major cause of morbidity and mortality in children in the developing countries. In the pediatric age group, it can be congenital or acquired. This study sought to identify the etiologies and outcomes of intestinal obstruction in the pediatric age group at Moi Teaching and Referral Hospital, Kenya.

Methods: This study was a prospective descriptive study. It included 83 children below 13 years who were operated on for intestinal obstruction between January 2015 to January 2016. Relevant data on clinical presentation, duration of onset of symptoms, investigations and intraoperative findings were entered into the data collection sheet. Daily follow up was done until discharge or in-hospital death, and outcomes recorded.

Results: A total of 83 patients were studied. Age of the patients ranged from 1 day to 13 years old, with a mean of 2.67 (SD \pm 2.2) years. Neonates constituted 38.6% of the study participants. The male to female ratio was 2.95:1. The most common etiology was intussusception (30.1%). The complication rate was 16.9%. The average length of hospitalization was 7.9 \pm 5.3 days. The in-hospital mortality was 16.9%.

Conclusion: The commonest aetiology of intestinal obstruction in the pediatric age group at Moi teaching and referral hospital is intussusception. Mortality and morbidity rates are high. Factors co-related with mortality are deranged potassium level, neonates, referrals, development of complications and late presentation (>24hrs).

INTRODUCTION

Intestinal obstruction (I.O) is the commonest life-threatening emergency all around the world requiring emergency management. It occurs when there is interruption in the forward flow of the intestinal contents. It is a major cause of morbidity and mortality in children in the developing countries. In the paediatric age group it can be congenital or acquired. Congenital aetiologies include anorectal malformations (ARM), intestinal atresia, congenital hypertrophic pyloric stenosis while acquired aetiologies include intussusception, ascariasis, hernias.

In neonates, ARM is the most common cause of intestinal obstruction (I.O) (1) while in older children, intussusception is considered the most common cause (2).

Among the leading causes of high morbidity and mortality in developing countries are delayed

presentation and poverty (3). Children constitute more than 40% of the population in most developing countries and therefore deserve a share of robust surgical care; thus, surgical services should be planned to reduce mortalities associated with these abdominal emergencies (3). Also, there is paucity of data at Moi Teaching and Referral Hospital (MTRH) regarding I.O in children. This study will therefore act as a backbone in comparing the data from MTRH and various other institutions. This study aims at elucidating the various etiologies and immediate post-surgical outcomes in children managed for intestinal obstruction at the MTRH and the various factors co-related with mortality.

METHODOLOGY

A prospective descriptive study of children aged below 13 years presenting with

intestinal obstruction at MTRH (surgical wards and newborn unit) between January 2015 to January 2016. It is a census study.

Inclusion criteria:

- Children operated on for I.O at the MTRH.
- Children with a consent and assent for those above 7 years.

Exclusion criteria: Patient who had been operated elsewhere and then referred to MTRH

The starting point of data collection was in the surgical wards and newborn unit after patients were identified from the theatre register. Patients who met the inclusion criteria were consecutively enrolled in the study. Data collection was conducted by the investigator and entailed filling questionnaire on clinical presentation, duration of onset of symptoms, investigations, supportive management and intraoperative findings as per case notes. Outcome evaluation parameters included complications, hospital stay and death. Daily follow-up was done until discharge or in-hospital death, either of which was taken as the end point of the study. All filled questionnaires were checked for completeness and coded accordingly. Data was entered into an Access database and exported to SPSS version 20.0 for analysis. Continuous data were analyzed using means and standard deviation (SD). Categorical data were presented as frequency tables and charts. For binary data, Chi-square test and Fishers exact test were used for analysis. P-value of <0.05 was noted significant.

Ethical statement: This study was approved by Institutional research and ethics committee (IREC), file approval number (FAN) 1277. Approval from the MTRH was also sought and granted.

RESULTS

The age of patients ranged from 1 day to 13 years old, with a mean of 2.67 and SD of ± 2.2

years. Neonates comprised 32 (38.6%) out of the 83 children. The male to female ratio was 2.95:1. Diverse etiologies were identified and are shown in figure 1 and 2 below.

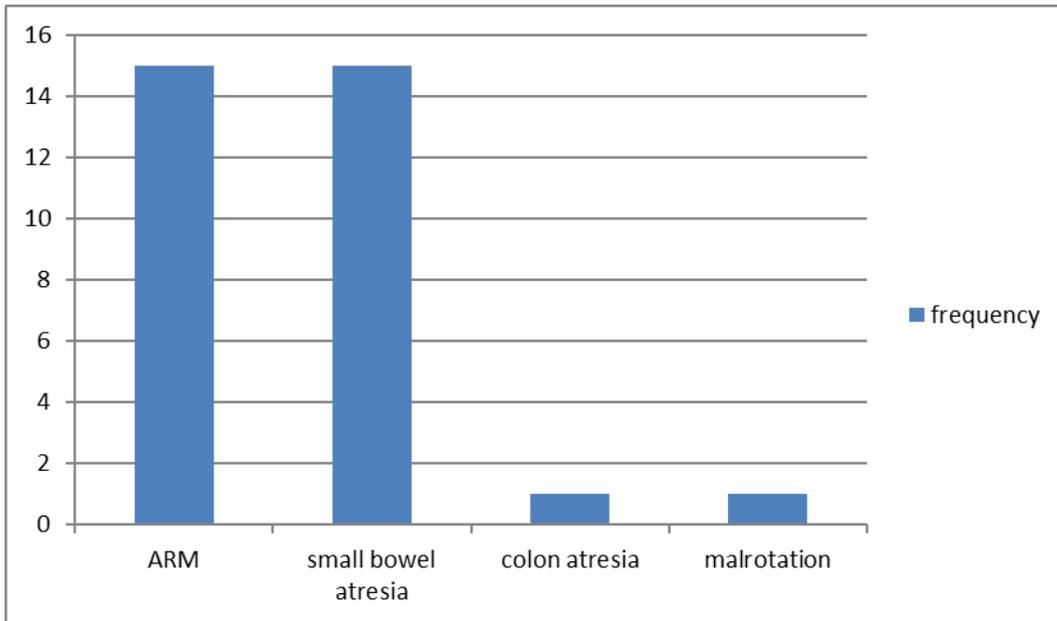


Figure 1. Aetiologies in neonates

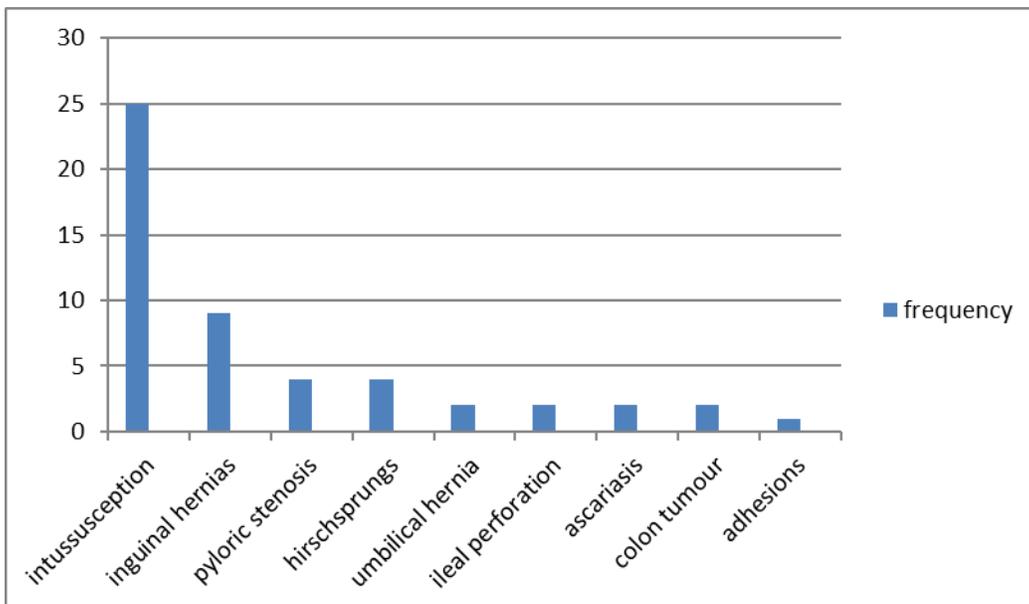


Figure 2. Aetiologies in non-neonates

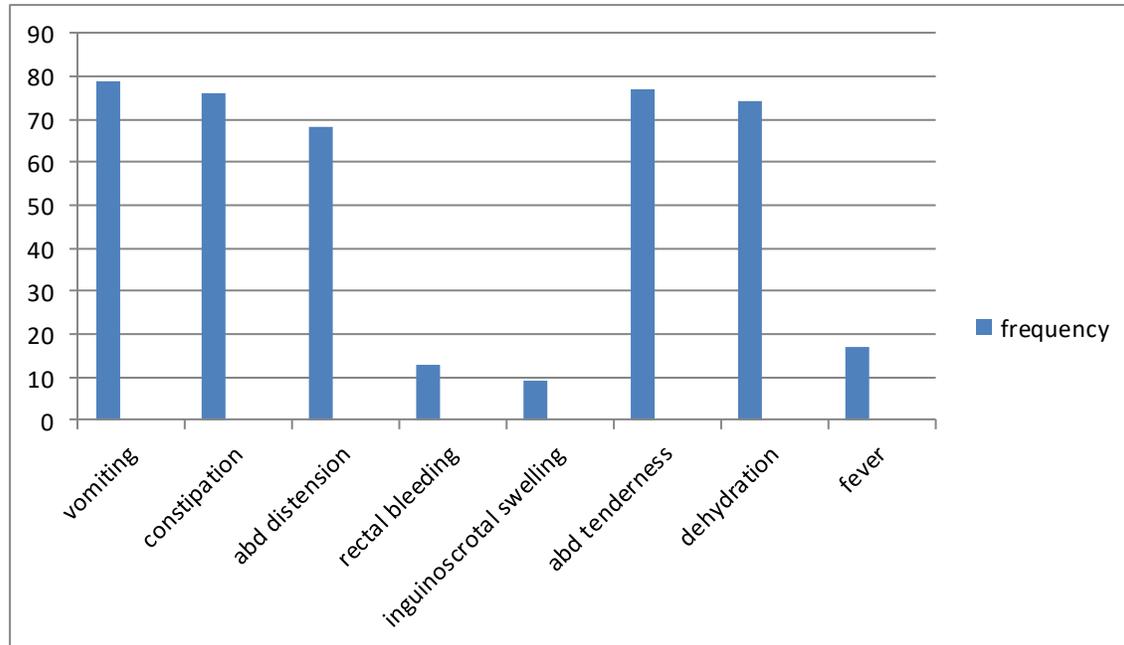


Figure 3. Clinical presentation

Outcomes: The average length of hospitalization was about 7.9 ± 5.3 days, ranging from 1 day to 25 days. The post-operative complication rate was 16.9% (n=14). The overall in-hospital mortality was 16.9% (14 patients) with majority (n=11) being neonates.

Table 1

Case-specific mortality

etiologies	Frequency (%)
ARM	5 (33.3%)
Small bowel atresia	5 (33.3%)
intussusception	2 (8%)
Colon atresia	1 (100%)
Ileal perforations	1 (50%)
Total	14

Table 2

Complications

Complication	Frequency (%)
Septicaemia	9 (64.29)
Wound dehiscense	2 (14.29)
Electrolytes derangement	1 (7.14)
Prolapsed stoma	1 (7.14)
Enterocutaneous fistula	1 (7.14)
Total	14 (100)

Factors co-related with mortality: Development of complications, duration of illness (>24 hours), deranged potassium levels, referrals and neonates had significant co-relation with mortality (Table 3).

Table 3*Co-relation between various variables and eventual outcome (Alive /Dead)*

		Outcome		p-value
		Alive	Dead	
Presence of complications	No	63	6	0.0001
	Yes	6	8	
Sex	Male	51	11	0.713
	Female	18	3	
WBC	Normal	43	9	0.89
	Abnormal	26	5	
Gut viability	viable	63	11	0.089
	gangrene	6	3	
Duration of illness	<24hours	12	1	0.0023
	>24hours	57	13	
Referral status	Referrals	33	11	0.035
	Home	36	3	
Potassium level	normal	46	5	0.0396
	Abnormal	23	9	
Heamoglobin level	Normal	43	7	0.39
	Abnormal	26	7	
Age group	<1 month	21	11	0.0006
	>1 month	48	3	

DISCUSSION

Male to female ratio is similar to what was found in other studies. In a study in India, the male to female ratio was found out to be 2.22:1, mean age of presentation was 7.09 years and 73% of patients were above 3 years of age which varies greatly with findings in this study(4). The higher number of neonates and infants is likely due to regionalization of pediatric surgical services at MTRH thus indicating that other hospitals in the region may not be in a position to offer adequate health services to the very young and therefore being referred to MTRH. The increased male to female ratio is probably due

to the variation in anatomy leaving male more susceptible to pathologies.

The aetiologies found in this study differ from studies elsewhere. A study done in Kashmir stated that the causes of intestinal obstruction in children included ascariasis (63.2%), adhesion (11.1%), intussusception (10.1%) and obstructed hernia (8.2%) (5) while in this study intussusception was the commonest. The tertiary nature of services offered may explain the difference in aetiologies when compared to studies from similar economic regions. Referrals from various regions also contribute to the various and common etiologies found at MTRH

Intussusception has maintained its burden as one of the commonest abdominal surgical emergencies not only in this region but also in most parts of the world (5,6,7). Anorectal malformation and small bowel atresia are the most common cause of I.O in neonates in this study. This is similar to other studies (8,9,10). Vomiting (95.2%), constipation (91.6%), abdominal tenderness (92.8%) and dehydration (89.2%) were the most common symptoms and signs noted. This is similar to other studies (11,12).

In this study, the complication rate was lower than what was found in Niger(13) but slightly higher than what was found in Tenwek, Kenya(10). Mortality rate in this study was slightly higher than what was found in Niger(13) and Tenwek(10) but lower than in Iraq(14). This might be due to the delayed presentation of patients being referred and also due to variance in etiologies.

Intussusception in this study had a case fatality of 8% while in Tanzania it was reported to be 25%(15). This might be due to the findings intra-operatively where in this study 24% had non-viable gut while in Tanzania it was 39.3%

The highest mortality was among neonates. This is in agreement with Jumbi et al who noted that mortality was highest at extremes of ages (16). This is likely due to low immunity and physiological body reserves in children particularly the newborns and infants. In addition, MTRH lacks total parenteral nutrition and pediatric ICU facilities and this may compound the problem among the very young patients who may need these facilities.

Various studies have reported early presentation as a positive factor in preventing morbidity and mortality in children (3,6). In this study also, duration of presentation of

more than 24 hours has a positive co-relation with mortality.

Inefficient referral system also had positive co-relation with mortality. The referral process in most cases follows the chain of hierarchy according to the hospital level leading to delays, during which time the patient's condition may deteriorate, leading to increased operative risk and mortality (17).

CONCLUSION

Intussusception is the commonest aetiology of intestinal obstruction in the pediatric age group at MTRH followed by small bowel atresia and ARM. Morbidity and mortality rates are high. Factors affecting mortality are development of complications, duration of illness (>24 hours), deranged potassium levels, referrals and neonates. Early referral with adequate fluid and electrolyte stabilization is required.

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