

# Acute Non-Traumatic Abdominal Pain in Childhood at Kenyatta National Hospital, Kenya

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## Abstract

### Background

The assessment and diagnosis of acute abdominal pain in childhood is clinically challenging. The epidemiologic correlates differ for different paediatric age groups and settings.

### Objectives

To determine the clinical spectrum of acute abdominal pain in childhood at a referral Kenyan public hospital.

### Design

Cross-sectional observational prospective study of 390 children presenting at the paediatric filter Clinic and wards at Kenyatta National Hospital.

### Results

Boys were majority (62.4%). The mean patient age was 4.3 years. One hundred and thirty one patients (33.6%) were admitted and 74 of these (56.5%) underwent surgery. Majority of the children presented

after 48 hours of onset of the abdominal pain. Surgical causes constituted 14% of all cases seen in the filter clinic. The most common causes of surgical abdominal pain were intussusceptions (25.7%) and appendicitis (30%) in infants and children > 6 years of age respectively. Of non surgical causes, upper respiratory tract infections (21%), gastroenteritis (15.6%) and non-specific abdominal pain (9.2%) predominated.

### Conclusions

Medical causes are the leading cause of Acute Abdominal Pain in our locality but important and life threatening surgical causes must be recognized. Intussusception is a leading diagnosis in the infant while appendicitis is a top etiology in older children. History and physical examination remain the cornerstones in the approach to a patient with acute abdominal pain.

## Introduction

The term "acute abdominal pain" encompasses a spectrum of surgical, medical and gynecological conditions, ranging from trivial to life threatening. The frequency and nature of surgical etiologies differ from population to population (1,2,3). Of general surgical emergency admissions, 50% present with acute abdominal pain, contributing a significant part of the general surgical workload (4,5).

In the United Kingdom 90% of all children presenting with acute abdominal pain have a non-surgical self-limiting condition or acute appendicitis (6). In Turkey 5.4% of children have surgically related acute abdominal pain (2). The surgical cases are associated with significant mortality. In one account, 30-day mortality of 4% among patients admitted with acute abdominal pain rose to 8% in those undergoing operative treatment (6). The mortality rate varies with age, the diagnosis and the time taken to initiate operative treatment (3,4).

Kenyatta National hospital is the largest pediatric surgical unit in Kenya. The profile of adult acute abdominal pain at the Institution has been documented (5) but none for the pediatric population. This study evaluates the presen-

tation, management and outcome of acute abdominal pain as seen at the hospital.

## Materials and Methods

This was a cross-sectional observational prospective study conducted at the Kenyatta National Hospital (KNH), Nairobi between November 2005 and March 2006. KNH is a central referral hospital and also a teaching facility for the University of Nairobi. The KNH ethics and research committee approved the study.

A sample size of 384 was statistically determined and the patients recruited by non-probability consecutive sampling method. All children less than 13 years of age were included. Data sources included patient/parent interviews, case notes and surgical operation notes. Data captured included the characteristics of the pain (duration, location, intensity, radiation), associated symptoms, physical examination findings, investigations, initial diagnosis in the filter clinics and in the ward, operative or non-operative management, operative diagnosis and outcome (discharge, death, length of stay). Data were analyzed using SPSS 11.5 /PC+ software for Windows and summarized as means or proportions.

## Results

A total of 12,000 children were seen in the paediatric filter clinic during the study period, three hundred and ninety (3.25%) of these presented with acute abdominal pain (Table 1). There were 244 males (62.6%) giving a male to female ratio of 1.6:1.

Majority (n = 259, 66.4%) of the children were discharged from the filter clinic. One hundred and thirty one were admitted to the pediatric surgical ward (n = 112) and the general pediatric ward (n = 19) (Table 2). Four patients from the general pediatric ward were later transferred to the pediatric surgical ward.

The duration of symptoms ranged between one and seven days (Fig. 1). Majority of children presented three or more days after the onset of abdominal pain. The pain was located in all regions of the abdomen (Table 1).

Vomiting was the most common (in 40.3% of patients) associated symptom. Thirty seven (23.6%) were bilious vomiting and five (3.2%) feculent.

Plain abdominal X rays were the most frequently requested investigations. Imaging as a modality of investigation was requested in 35 (9%) children. The other investigations commonly requested were urea, electrolytes and creatinine, haemoglobin level and a full haemogram.

Admission diagnoses are listed in Table 2. Seventy patients (56% of the admissions and 19% of the total number of patients) underwent operative management. The four most common intraoperative diagnoses were appendicitis (30%), intussusceptions (25.7%), intestinal obstruction (14.9%) and groin hernia (13.5%) (Table 3). Of twenty two children found to have appendicitis (mean age 9.2 years, range 6-13 years), 14 were males, fifteen (68.1%) had perforated appendicitis, all presented 36 hours after the onset of pain and five (22.7%) had a correct initial diagnoses of acute appendicitis made in casualty/filter clinic.

Of the nineteen children found to have intussusceptions, twelve were males, sixteen were infants and none had a correct initial diagnosis at the pediatric filter clinic. Eight children with sickle cell painful crises were managed non operatively. Malaria and HIV disease were other conditions that contributed to AAP seen in the paediatric filter clinic. Thirty six children had (9.2%) non-specific abdominal pain (Table 4).

Age in years	No.of patients	Percentage
1	60	15.4
2	43	11.0
3	50	12.8
4	47	12.1
5	47	12.1
6	29	7.4
7	16	4.1
8	19	4.9
9	24	6.2
10	20	5.1
11	16	4.1
12	18	4.6
13	1	0.26
<b>Total</b>	<b>390</b>	<b>100.0</b>
Location of Pain		
Central abdomen	71	18.0
Upper abdomen	65	17.0
Lower abdomen	93	24.0
Generalised	89	23.0
Unknown	72	18.0
<b>Total</b>	<b>390</b>	<b>100.0</b>

Table 1: Age and site distribution

	Clinical diagnosis	No.of patients	Percentage
<b>Surgical ward</b>	Intussusception	34	26.0
	Peritonitis	19	14.5
	Intestinal obstruction	9	6.7
	inguinal hernia	12	9.2
	abd. wall abscess	3	2.3
	Appendicitis	17	13.0
	Umbilical hernia	5	3.8
	Neonatal sepsis	2	1.5
	Congenital bowel atresia	1	0.8
	Gastritis	6	4.6
	Feecal impaction	4	3.1
	<b>Total</b>	<b>112</b>	<b>85.5</b>
	<b>Medical wards</b>	Abdominal colic	4
Typhoid		7	5.3
Gastro enteritis		8	6.1
<b>Total</b>	<b>19</b>	<b>14.5</b>	
<b>Grand Total</b>	<b>131</b>	<b>100.0</b>	

Table 2: Clinical diagnosis from ward

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Nyaga E.M, J.M Ndungu, Anangwe G.C.N.

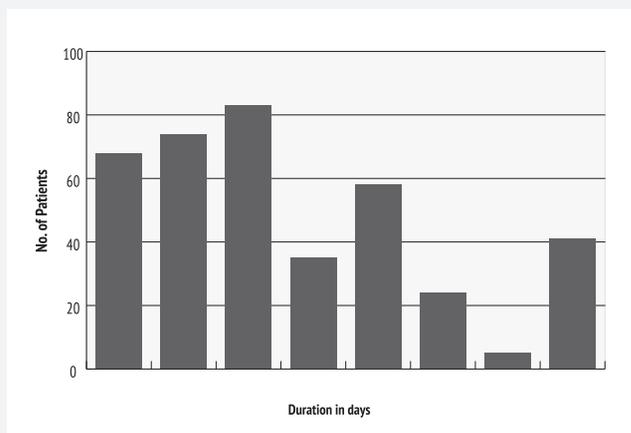


Fig. 1: Duration of symptoms

Diagnosis	Frequency	Percentage
Intussusceptions	19	25.7
Appendicitis	22	30
Inguinal hernia	10	13.5
Intestinal obstruction	11	14.9
Umbilical hernia	5	6.8
Ileal perforation/typhoid	5	6.8
Testicular torsion	2	2.7
<b>Total</b>	<b>74</b>	<b>100.0</b>

Table 3: Intra Operative Findings

	Frequency	%of the total patients
Sickle cell painful crises	8	2.1
Non-specific abdominal pain	36	9.2
HIV disease	8	2.1
Malaria	8	2.1
Amoebiasis	4	1.0
Neonatal sepsis	2	0.5

Table 4: Unusual causes of AAP

No of days	No.of patients	Percentages
1 - 3	50	38.2
4 - 6	34	26.0
7 - 9	27	20.6
10 - 14	12	9.1
>14	5	3.8
>30	3	2.3
<b>Total</b>	<b>131</b>	<b>100.0</b>

Table 5: Duration of hospital stay

The mean duration of hospital stay was 6.9 ±1 days for all the patients admitted. Patients who underwent any form of operation had a longer duration of stay (mean duration of 11.5 days). The 8 patients who were in hospital for more than two weeks (Table 5) all had developed wound septic complications following operation. Two patients died (mortality rate 1.5%).

**Discussion**

Acute abdominal pain (AAP) is a common problem in childhood. This study reviewed the pattern of presentation and practice with reference to acute abdominal pain in children less than 13 years. Children reviewed with abdominal pain constituted 3.3% of all the children seen in the paediatric filter clinic, boys predominated and the use of imaging diagnostic aids was uncommon. The likelihood of admission for a child presenting with AAP at the KNH filter clinic was 19%, and if admitted, there was a 56% chance of undergoing surgery. These findings are similar to previous accounts (2,7,8). Tulay et al have reported a rate of 5% for abdominal pain among children at an Istanbul University hospital (2). At the Guys Hospital, 46% of the children were operated (8) while in the Central African study 50% of the children seen with acute abdominal pain underwent surgery (7,9).

Diagnostic images were utilized in about one fifth of the cases. This is a remarkably low rate considering that only 23% of the children presented with generalized peritonitis, a scenario that obviates the need for imaging. In Turkey, this rate was 25% for use of plain radiographs and 7.3% for ultrasonography (2). The best radiographic test for patients who present with an equivocal history or physical examination findings remains controversial. Computerised Tomography scanning and ultrasonography are the two most useful studies. The literature supports the use of either study as a diagnostic tool because both have high and comparable sensitivity and specificity (10,11,12).

The main conditions requiring surgical intervention in this study compares well with the Central African study which found appendicitis to contribute to 32.4%, hernia 4.8% and typhoid perforation 9.9% (7). Appendicitis in the Guys hospital study contributed to 31%, constipation 9%, but at the Princess Margaret Hospital for children in Australia, 74% of the children undergoing surgery were found to have appendicitis (8,9). The Aus-

tralian hospital is a strictly tertiary referral hospital unlike the KNH which operates as both a tertiary and a primary facility. All children are referred to the Australian facility with a diagnosis suggestive of a surgical cause of AAP, reflected in the higher percentage of children with appendicitis.

Broad diagnoses of acute abdomen and peritonitis were made at admission. The suspicion for appendicitis was low in this study, possibly due to the high rate of perforation (68.1%) with most children presenting with peritonitis. Appendicitis should be suspected as the cause of peritonitis in the older child even at outpatient clinic settings. Delay in presentation and treatment is modifiable to optimize care in appendicitis. In most other studies, the incidence of advanced appendicitis is between 30% and 51% (13).

Intussusception was most common (84.2%) in the infant population, as has been reported before. In Tanzania, Shija has reported that intussusception accounts for two-thirds of cases of intestinal obstruction during infancy (14). Whereas the classical features of intermittent colicky pain, vomiting, constipation and a palpable mass are early features of the disease, the passage of "red-currant jelly" stool is a late sign. Late cases may also present with abdominal distension, abdominal tenderness, bloody diarrhea and dehydration rather than any of the early features (14). The reduction of an intussusception with contrast enema has become the standard in many institutions (success rates ranging from 75% to 85%) with surgery reserved for those that fail enema reduction, those where a pathological lead point is identified on an imaging study, or in the presence of free air or peritonitis (14). Despite this high success rate of non-operative management, operative treatment for all patients with suspected intussusception was the norm in our study.

Non-specific abdominal pain is reported as a common cause of AAP in children, being seen more commonly in late childhood and early adolescence. In one account of AAP, 54% of the patients were discharged without surgical intervention and in this group, the most frequent diagnosis was non-specific abdominal pain (9). In the current study, non-specific abdominal pain contributed to 9.2% of the cases seen in casualty. In the Central African Republic study no cause of abdominal pain was found in 22.8% of the cases (7).

In conclusion the study findings compare favorably with previous reports. The etiology of AAP varies across the age groups and geographical localities. Medical causes predominate, appendicitis is common in the older child while intussusception is more common in infants.

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