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PREVALENCE OF CONSTIPATION AMONG CHILDREN REFERRED TO GASTROENTEROLOGY CLINIC WITH CHRONIC ABDOMINAL PAIN AT KENYATTA NATIONAL HOSPITAL
A. Abdurahman, MBChB, MMed, A. Laving, MBChB, MMed, Lecturer, and D.Wamalwa, MBChB, MMed, Lecturer, Department of Paediatrics and Child Health, College of Health Sciences, University of Nairobi, P.O. Box 19676, Nairobi, Kenya

Request for reprints to: A. Abdurahman, Department of Paediatrics and Child Health, College of Health Sciences, University of Nairobi, P.O. Box 19676 - 00202, Nairobi, Kenya.

PREVALENCE OF CONSTIPATION AMONG CHILDREN REFERRED TO GASTROENTEROLOGY CLINIC WITH CHRONIC ABDOMINAL PAIN AT KENYATTA NATIONAL HOSPITAL

A. ABDURAHMAN, A. LAVING and D. WAMALWA,

ABSTRACT

Background: **Chronic abdominal pain is one of the most common presenting complaints to primary care providers and paediatricians. Studies in developed countries have shown that constipation is one of the most common diagnoses in children presenting with chronic abdominal pain.**
Objectives: **To determine the prevalence of constipation in children 4-13 years presenting with chronic abdominal pain and to describe the pharmacological and non-pharmacological management of children with constipation at Kenyatta National Hospital.**
Design: **A cross-sectional hospital based study.**
Setting: **Paediatric Gastroenterology Clinic, Kenyatta National Hospital.**
Subjects: **children aged 4 to 13 years attending the paediatric gastroenterology clinic at Kenyatta National Hospital between July to December 2014.**
Results: **A total of 84 children with chronic abdominal pain were seen, 47 (55.95%) were girls and the median age was nine years. The prevalence of constipation in children with chronic abdominal pain with two or more Rome III criteria was 69 out of 84 (82%, 95%CI: 72%95%), out of which there were 37(53.62%) females and 32(46.3%) males. The difference among the boys and girls was not statistically significant. Pharmacological management was more commonly used than non-pharmacological management. The most common medication given to children with constipation was lactulose given to 63(91.3%) of the children. The non-pharmacological management of constipation was education and dietary advice 53(76.8%), while behaviour change advice was given to 28 (40.6 %).**
Conclusion: **The prevalence of constipation in children with chronic abdominal pain was 82%. Pharmacological management was more commonly used than non-pharmacological.**

INTRODUCTION

Globally chronic abdominal pain (CAP) is one of the most common presenting complaints among children seen by primary care providers and paediatricians(1). CAP affects 10–15% of 4–16-year-old children, with considerable morbidity. Recurrent abdominal pain (RAP) often has a great impact on the life of the child and his family and frequently causes much anxiety(2).

CAP is defined clinically as: the occurrence of three or more bouts of pain severe enough to affect the child's activities over a period, of not less than three months(3).

Many times, chronic abdominal pain in children is functional with no objective evidence for an organic disorder being found(4,5). Studies have shown that constipation is one of the most common diagnoses in children presenting with chronic abdominal pain children.

Early diagnosis and management of constipation is important and the use of laxatives has been recommended as first line treatment for constipation. Changes in diet,fluid intake and life style may be beneficial in cases of simple constipation (NICE 2010)(6). Early recognition of constipation and appropriate treatment are necessary for successful outcome and improved quality of life(7).

Globally, the prevalence of constipation in all age groups has been found to range between 0.7% to 79% with the prevalence rate among children being between 0.7% to 29.6%(8).

In children, constipation is one of the most common problems accounting for 3-10% of visits in general pediatric clinics and up to 25% of referrals to pediatric gastroenterologists(9). For many parents, constipation is a source of anxiety.

This study sought to determine the prevalence of constipation among children presenting with chronic abdominal pain and to describe the treatment given to these children at the Kenyatta National Hospital.

MATERIALS AND METHODS

This is a cross sectional study carried out at the paediatric gastroenterology clinic of Kenyatta National Hospital (KNH). KNH is Kenya's national referral hospital and is located at the Upper Hill area of Nairobi, the country's

capital city. The subjects studied were 4-13 year old children who presented with chronic abdominal painbetween July to December 2014.

The Peadiatric Gastroenterology Clinic is the only gastroenterology clinic in KNH and is a referral clinic for all children with problems of the gastrointestinal tract.

Data Collection Tools and methods: Data were collected using various tools and techniques described as follows. A semi-structured questionnaire was used by the principal investigator who was assisted by a research assistant to collect and record the patient data after obtaining informed consent from the care giver/guardian. Assent was obtained from the older children.A questionnaire was completed for each patient. Data collected included presenting symptoms, which included history of CAP and symptoms associated with CAP. Then Rome III questionnaire adopted from the Rome Foundation was applied. Large feces, painful defecation, withholding behaviour, soiling, and other manifestation like rectal bleeding. Children were examinedto exclude suspected malignancy. Then the initial management given for the constipation was recorded.

Data Analysis: The data were confirmed for completeness, coded and then entered into a computer using SPSS software version 19.0 which was used for the analysis. Descriptive analysis was used to determine the mean, frequency and proportion of variables. Results were presented in the form of frequency tables, pie charts and figures together with their descriptions.

Ethical approval and confidentiality: The current study was approved by Kenyatta National Hospital/University of Nairobi/Ethics and Research Committee. Informed written consent was obtained from the primary caregiver/guardian for enrollment into the study. Assent was obtained from the older children.

The researcher maintained maximum confidentiality for all information and data presented by the respondents. All information collected on the patients was considered confidential and treated as such. The instruments used for the research were void of the patients' names to ensure confidentiality. Documents containing patient's confidential information were neither photocopied nor were the names of the patients or clinicians recorded.

RESULTS

The study recruited 92 children between 4-13 years of age, five children were excluded because of acute abdomen and four children had known malignancies. Therefore the study included 84 children with chronic abdominal pain during the period July to December 2014.

Characteristics of the assessed children: Most of the patients were female 47 (55.95%). of the children were aged between 10-14 years (36.9%).The median age of the respondents was nine years Most of the respondents were school aged children (72.6%) that is from 7-13years, more than the pre-school children as shown in Table 1.

Assessment of Abdominal pain: The assessment andthe characteristics of the abdominal pain in children shown in the table 2.

Children who experienced abdominal pain for more than 1 year were 40 (47.6%). Eighteen children (21.4%) had abdominal pain for 4-11months while 26(31.0%) had abdominal pain for 3months. Peri-umbilical pain, the most common type abdominal pain occurred in 31(36.47%) of the children, upper abdominal and lower abdominal pain occurred in 26(30.9%) and 24(28.6%) of the children respectively. Only a few children complained of pain on the right and left side of the abdomen. The severity of the abdominal pain was moderate in most of the participants 45(52.4%). A little discomfort was felt in 27(32.1%) of the children while very severe pain occurred in 9(10.7%). Only 4(4.76%) of the children could not characterize the severity of the pain.

According to the duration of pain episode most of the respondents experienced pain for less than an hour 50(59.5%) while 19(22.6%) had pain that lasted 1-2hours, 14(16.7%) of the children had pain that lasted for 2-4hours, while only 1(1.2%) had pain all the time.

Table 1
Description of the participants (N=84)

Age distribution	Number (n)	Percent (%)
Age group		
4-6 years (pre-school)	23	27.4
7-9 years (school aged children)	30	35.7
10-14 years (school aged children)	31	36.9
Sex		
Female	47	55.9
Male	37	44.1

Table 2
Characteristics of the abdominal pain

Assessment of abdominal pain	Frequency	Percent (%)
Duration of abdominal pain	26	31.0
3 months	18	21.4
4-11 months	40	47.6
>1 year		
Part of the abdomen with pain		
Lower abdomen	24	28.6
Upper abdomen	26	30.9
Periumblical	31	36.9
Left side abdomen	2	2.4
Right side of the abdomen	1	1.2
Severity of the abdominal pain		
Little Discomfort	27	32.1
Moderate	45	52.4
Severe	9	10.7
Don't know	4	4.8
The duration of pain episode		
Less than 1 hour	50	59.5
1-2 hour	19	22.6
2-4 hour	14	16.7
All the time	1	1.2

Table 3
Feelings and discomfort associated with abdominal pain

Feelings and discomfort associated with abdominal pain	Frequency	Percent (%)
Bloated belly		
No	54	64.3
Yes	30	35.7
Loss of appetite		
Yes	40	47.6
No	44	52.4
Headache		
Yes	18	21.4
No	66	78.6
Pain in the arms, legs, or back		
Yes	17	20.2
No	67	79.8
Difficulty in sleeping		
Yes	46	54.8
No	38	45.2
Dizziness		
Yes	18	21.4
No	66	78.6
Feeling better after defecation		
Yes	51	60.7
No	33	39.3
Consulted previously		
Yes	67	79.8
No	17	20.2

The symptoms and the discomfort associated while having abdominal pain are shown in Table 3. Thirty (35.7%) of the children had bloated abdomen associated with the abdominal pain. Half of the children with abdominal pain had associated loss of appetite 40 (47.6%) and a few children 18(21.4%) had headache.

Most of the children 67(79.8%) did not have pain in the legs or arms. Most of the children 46(54.8%) had difficultyin sleepingand few children 18(21.4%) felt dizzy or faint Most of the children 51(60.7)with abdominal pain felt better after passing stool.

The figure1 below shows that most of the children with abdominal pain 65(77.4%)missed school during the period of the abdominal pain.

Figure 2 below demonstrates the frequency of Rome III criteria among children with chronic abdominal pain. Most of the children were having hard/painful stool and feacal mass in the rectum Forty two out of 84(50.00%) while30/84(35.7%) of the children had two or fewer defecations in the toilet per week. Twenty two out of 84(26.19%) of the children displayed withholding behaviour. A large stool diameter that clogged the toilet occurred in 21/84(25.0%) of the children, while fecal soiling was the least frequent symptom and occurred in 13/84(15.5%).

The prevalence of constipation in children with chronic abdominal pain with two or more Rome III criteria was 69 out of 84 (82%, 95%CI: 72%95%) out of which females were 37(53.62) and males were 32(46.3%).The difference in the prevalence of Constipation among the boys and girls was not statistically significant (p-value >0.05).

Figure 1

Child missing school due to chronic abdominal pain

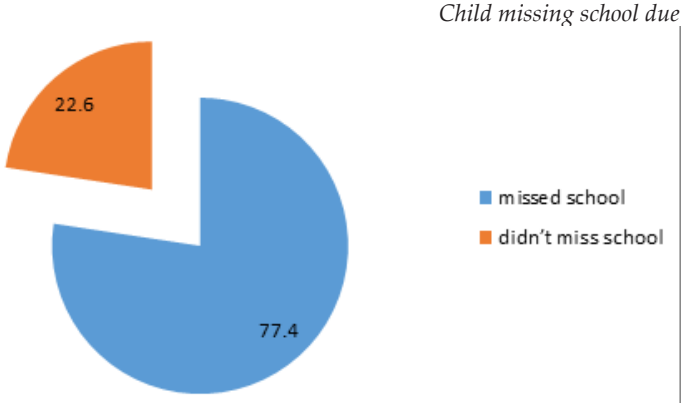

Figure 2

Frequency of Rome III criteria among children with chronic abdominal pain

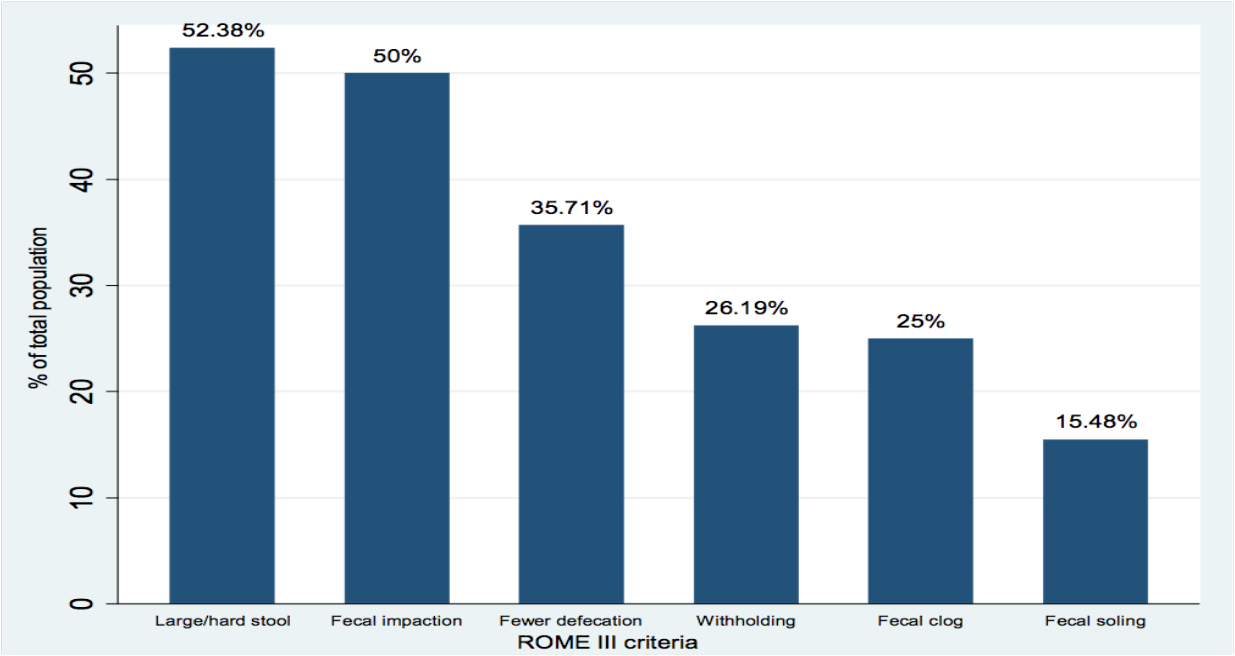

Figure 3
Prevalence of constipation in children with chronic abdominal pain

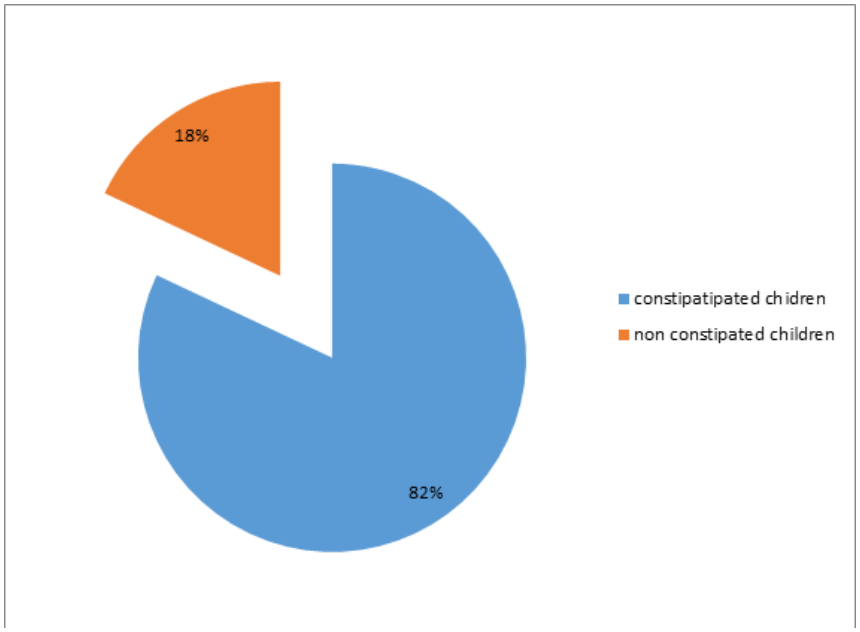

Table 4
Pharmacological and non-pharmacological management of constipation

Management of constipation(N=69) Pharmacological/ Non-pharmacological	N	Percent (%)
Pharmacological		
Lactulose syrup	63	
Milk of magnesium	29	91.3%
Dis-impaction(PEG3350)	6	42.0%
Non-pharmacological management of constipation		8.6%
Advised to use toilet shortly after meals		
Education and Specific dietary advise	28	40.6
Lactulose syrup/Milk of magnesium/Dietary advice/water intake / Behavioural change	53	76.8
	29	42.0%
Lactulose/Dietary advice/water	18	26.1%
Dis-impaction/water intake/ Dietary advice	6	8.7%
Lactulose alone	16	23.2%

The management given to the children with constipation included: Most of the children were treated with pharmaceutical agents. Lactulose was used in 63(91.3%) patients, while milk of magnesium was given to 29(42.0%). Six (8.7%) patients had dis-impaction using PEG.

Non-pharmacological management of constipation consisted of education and dietary advice 53 (76.8%) . Advice on behavioural modification was given to 28 (40.6 %).

Lactulose syrup, milk of magnesium, educational and dietary advice and behavioural change which was implemented in 29(42.0%) of the children. Lactulose,educational and dietary advice was given to 18(26.1%) of the children, while dis-impaction, education and dietary advice was given to 6(8.7%). Lactulose alone was given to 16(23.2%) of the children as shown in Table 4.

DISCUSSION

The study sought to determine prevalence of constipation in children 4-13 year old presenting with chronic abdominal pain at KNH in Nairobi and to describe the management of children with constipation in these children. The study recruited 84 children presenting to the paediatrics

gastroenterology clinic at KNH for chronic abdominal pain between July-December 2014.

Out of these 84 patients, majority of the respondents were school aged children between 7-13 years (72.26%) with a median age of nine (9) years. Majority of the patients were female (55.95%) and there was no statistical difference between male and female respondents (p=0.123). As in our study Leo *et al. (*10) also found a female preponderance of 60% among children with recurrent abdominal pain. The female preponderance may reflect a hyper-algesic state in female in both irritable bowel disease and constipation. In our study, school children were the ones mostly affected while in a study in south Jordan preschool children were the ones most commonly affected(2). Most of our subjects were experiencing pain in the peri-umbilical region 36.47. Localisation of pain at the peri-umbilical area was also found by Rasul and Khan *et al.* (10).

This may be attributed to the fact that most of the chronic abdominalare due to functional pains which commonly affect the peri-umbilical region. Our study found that (77.38%)of children with chronic abdominal pain missed school, this finding was comparable to that of Rasul and Khan *et al.* who showed that the majority of children with RAP do not attend schools regularly. This is because when children are having pain they are usually irritable and have some discomfort and is usually accompanied by loss of appetite which makes the children uneasy, not playful and unable to concentrate in school. This is also due to the parents' decision not to allow their children to go to school because of their worries and in most cases they take their children to hospital during the attack of the pain even during the school time. Even though, general consensus on RAP is that it is most common among the high academic achievers, data available up to date failed to show any association between RAP and school academic performance.

Our finding that 47.62% of children had recurrent abdominal pain more than one year which is similar to the 37.1% reported by Leo AA *et al.(*10).

The prevalence of constipation in children with chronic abdominal pain with two or more Rome III criteria was 69 out of 84 (82%, 95%CI:72% - 95%) out of these 37 (53.6%) were females and 32 (46.3%)were males. The difference in the prevalence of constipation among the boys and girls was not statistically significant (p >0.05).This finding is similar to Loening-Baucke and Swidsinski who reported that constipation is most frequent cause of chronic abdominal pain in children and that the prevalence of constipation in children with chronic abdominal pain was 83(11) he used Rome III criteria for diagnosis of constipation as it was done in our study.The study done by A MW Ali *et al* showed a high prevalence of constipation in 80% of children seen at the gastroenterology clinic in Sudan(12). Our prevalence is higher than the prevalence reported by Eildlitz-Markus *et al.* who found that the prevalence of constipation in children with recurrent abdominal pain was 57.4% at Schneider Children's Medical Center of Israel(13). Low prevalence could be attributed to different criteria used for the diagnosis of constipation.These being finding distended large intestines on plain abdominal X-ray and hard stool in the rectum.

A Gijbers *et al.* study in Juliana Children's Hospital in Netherlands found a lower prevalence of 46% (92/200) of constipation in children with recurrent abdominal pain(14). This lower prevalence was found using Rome II criteria for diagnosis of functional constipation which is an older criteria for constipation. While in our study we used Rome III criteria. A recent community-based study comparing Rome II and Rome III criteria showed a 2.5-fold higher prevalence of functional constipation use of Rome III criteria identified than that of Rome II criteria.

In our study lactulose was the medication which was most commonly used for treating constipation and combined with other non-pharmacological management.

In our study, lactulose was the medication which was most commonly used for treating constipation in 91.3% of the children similar l to Soo Hee Chang *et al* 15 whoreported the use of lactulose in 94% or polyethylene glycol(PEG)

This finding was similar to what Brazzelli and Griffiths *et al* Found in a South Korea where lactulose was the drug of choice for treating constipation (16). Unlike our study, PEG was the most commonly used medication for treating constipation in Iran by SoyluOb (17). In our study milk of magnesium was given to 42.0% of the children, while Soo Hee Chang *et al*.(15) reported that magnesium oxide was used in 44% . In our study dis-impaction was used for 8.6% of the children which is lower than Soo Hee Chang *et al.*(15) that reported13% oftheir gastroenterologist always performed dis-impaction as an initial treatment for constipation. The choice of the medication depends on the child's preference, safety, cost, ease of administration, and the practitioner's experience. In our study education and dietary advice was given 76.8% of the children which is similar toSoo Hee Chang *et al*(15) report that the gastroenterologists all recommended more intakes of fruits and vegetables, while only 25% of the gastroenterologists referred their patients to a dietitian. The combination lactulose syrup, Milk of magnesium, education and dietary advice and Behavioural change was given to 29 (42.0%) of the children. Brazzelli and Griffiths *et al* reported that combination of laxatives and behavioural modification is better than laxative therapy alone or behavioural modification alone for children with chronic constipation(16). Behavioural modification is an important component of therapy, particularly for children with constipation. It involves regular sitting on the toilet for up to five minutes three or four times a day after meals to establish normal bowell habits.

Previous clinical trial failed to show significant improvement of bowel habits after fiber treatment compared to placebo and traditional treatments such as lactulose (19, 20). Low fiber intake has been recognised as a risk factor for constipation. Adequate intake of dietary fiber (age + 5 in grams) reduces risk of constipation, but further increase in fiber has no proven therapeutic value. One study proved that polyethylene glycol (PEG) without electrolytes has cleared fecal impaction in 75% of children with constipation and children using higher doses had more clearance than those using lower doses (21).According to study by Young RJ *et al* report that increased water intake by 50% did not improve stool frequency or consistency (22).

In conclusion the prevalence of constipation in our study of children with chronic abdominal pain was 82%. Pharmacological management was more commonly used than the non-pharmacological and the most common drug prescribed was lactulose which was used for treating 91.3%

of children with constipation.

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