Original Article

Gum Arabic in treatment of functional constipation in children in Sudan

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ABSTRACT

Background: Constipation represents a common problem in children. The worldwide prevalence of functional constipation in children varies from 0.7% to 29.6%.

Objective: The aim of this study is to assess the response to Gum Arabic in addition to laxative in management of functional constipation.

Methods: All children less than 16 years old who suffered from constipation and attended Gaafar Ibnaouf Specialized Children Hospital and gastroenterology private clinic of one pediatric gastroenterologist between June 2011 and May 2012 were included in this study. Patients were considered having functional constipation according to Rome III criteria. They were divided randomly into two similar groups. Children in the first group were treated with laxative (lactulose), and those in the second group were treated with Gum Arabic in addition to laxative (lactulose), children in both groups were educated about the process of developing constipation, defecation process and approach to toilet training. All children were seen after 1month and 3 months after treatment, they were rated as successfully treated when they had ≥3 bowel movements per week, soft stool, no soiling or abdominal pain in the last 3weeks of treatment.

Results: A total of 150 children suffered from constipation were seen. (81males), the age was divided into three groups, the majority 96 (64 %) aged between 1-5years, and the least were 12 (8%) aged less than 1year. 133 children (88.7%) had functional constipation, while the remaining 17 children (11.3%) had an associated organic disorders, among them 12 children (8%) had Hirschsprung's disease, 2 children (1.3%) had hypothyroidism, 2 children (1.3%) had celiac disease, and 1child (0.7%) had cerebral palsy. The main clinical characteristic of functional constipation were faecal impaction presented in 59.4% of patients, straining in 43%, withholding behavior in 32.3%, soiling in 16.5%, abdominal pain in12% of patients. In those who were treated with Gum Arabic, 41/63 (65%) showed improvement at 1st month of treatment and 59/63 (93.6%) at 3rd month of treatment, while those who were treated with laxative alone showed that 34/60(56.66%) improved at 1month of treatment and 48/60 (80%) at 3rd month, with p value <0.025

Conclusions: Functional constipation is the most cause of constipation in Sudanese children. Gum Arabic achieved better results than laxative alone in treatment of functional constipation.

Keywords: Hirschsprung's disease, hypothyroidism, faecal impaction.

Constipation is a common problem in children accounting for 3–10% of visits to general pediatric clinics and up to 25% of referrals to pediatric gastroenterologists worldwide.[1]. It is generally divided into organic and functional types. The aetiology of organic constipation includes anorectal malformations, Hirschsprung disease, neurological abnormalities, or an endocrine and metabolic disorders, while functional type- which occurs in all pediatric age groups[2, 3] - is defined according to Rome III criteria and accounts for 0.7% to 29.6% of the visits to clinics.

There is no specific clinical presentation for functional constipation and hence exclusion of organic causes for constipation and the use of Rome III criteria are mandatory for its diagnosis.

Despite many attempts, treatment of functional constipation remains a challenge. Several studies had indicated that children with functional constipation have a

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substantially lower fibre intake than healthy controls, but others have not supported this finding[4-7]. We have conducted this study to verify the role Gum Arabic can play in sorting out this dilemma.

Objectives

The objective of this study is to evaluate the role of gum Arabic (safast) in treatment of functional constipation in children in Sudan.

Methodology:

This is a prospective comparative study. It was conducted at GaafarIbnaoufspecialised hospital for children and one private clinic of a pediatric gastroenterologist (Prof. Omyma Mohy Eldin Sabir).

Data from all children less than 16 years, who presented with constipation from June 2011-May 2012 were collected through interview questionnaire, analysed using SPSS.

Children with organic constipation were excluded. Those with functional constipation were randomly divided into two groups: Children in the first group were treated with laxative (lactulose) for 3-6 months; the dose was adjusted to achieve the goal of one to two soft motions per day without any discomfort.

Children in the second group were treated in addition to laxative (lactulose) with gum Arabic, 20-40g per day.

Parents were educated about the process of developing constipation, and normal defecation process, approach to toilet training, and mechanism of recovery, and duration of treatment to achieve regular bowel habit.

All children were seen after one and three months of treatment, they were rated as successfully treated when they had ≥ 3 bowel movements per week, no soiling and no abdominal pain in the last three weeks of treatment.

Ethical clearance was approved from GaafarIbnaouf Hospital and all families were consented after counselling.

Results

During the study period, a total of 150 children with constipation were seen. (81males). The age of the majority of children [96 (64 %)] was between 1-5years, and the least [12 (8%)] were less than one year**.**

133 children (88.7%) had functional constipation, while the remaining 17 children (11.3%) had an associated organic disorders, among them 12 children (8%) had Hirschsprung's disease, two children (1.3%) had hypothyroidism, two children (1.3%) had celiac disease, and one child (0.7%) had cerebral palsy.

Features of functional constipation included: faecal impaction in 59.4%, straining in 43%, withholding behaviour in 32.3%, soiling in 16.5%, abdominal pain in 12%, and abdominal distension in 4.5% of the patients.

Of the initial 133 children with functional constipation, 7 children were lost to follow up and another 3 children had incomplete follow up. Thus response to therapy could be assessed in 123 children (60 children in the first group and 63 in the second group).

In group one 34/60 (56.66%) improved at one month of treatment and 48/60 (80%) at three months, while in group two 41/63 (65%) showed improvement at 1st month of treatment and 59/63 (93.6%) at 3rd month of treatment. (Table 1) (P value < 0.025).

Table 1: Outcome among children who were treated with laxative ± Gum Arabic

Follow up	Successful outcome (%)	
	La (n = 60)	La + G A (n= 63)
1 month	34(56.7)	41(65.0
3 month	48(80)	59 (93.6)

(P value < 0.025) (La=Laxative)

Discussion

To the best of our knowledge – after reviewing English literature on line- this is the 1st study looking at the role of Gum Arabic in the treatment of functional constipation. In a study from Sudan [8] functional constipation was reported to affect 88.7% of constipated children.

Clinical presentation of constipation is protean. Rectal faecal mass is present in 30-75% of children with constipation[3]. Similar to that 59.4% of our patients had faecal impaction. On the other hand only 32.3% of our patient with functional constipation exhibit withholding behaviour which is far

less than the 97% reported in USA[9], this could be due to misinterpretation of symptoms. As symptom being noted verbatim, if the parents were not able to differentiate between the concept of retentive posturing and that they perceived as straining (reported in 43% of our cases), it is likely that many cases with withholding behaviour have been misinterpreted by the parents as attempts at straining for defecation.

Again faecal incontinence found in 16.5% of our patients is not going with the 30.8-85% rate reported elsewhere [9, 10]. This may indicate that constipation is less severe in Sudanese children. Having relatively high fiber diet in Sudan could be behind that.

Treatment of functional constipation in children remains a challenge. Many modalities of treatment (probiotics, oral laxatives, behavioral therapy, enemas, antegrade enemas, neuromodulation and surgery including rectosigmoid resection) were attempted.Conflicting evidence in the literature exists regarding the role of dietary fiber in the aetiology and treatment of childhood functional constipation[4, 5, 11, 12].

A systematic review, published in 2011, evaluated the effect of different fibers in the treatment of chronic constipation in adults and concluded that soluble fiber may be of benefit. However, data for insoluble fiber are conflicting[13].

In this study we used gum Arabic (safast) - which is known to have soluble fibres[14-16]- for treatment of functional constipation. It is also cheap and available.

Fibre gel polysaccharide from the Japanese konjac plant (Glucomannan), was compared to placebo in treatment of functional constipation and results showed improvement of symptoms in 68% at one month as compared with placebo treatment (13%)[17]. This is comparable to our finding (improvement in 65%) in the group treated with gum Arabic and laxative. However, the low response (13%) in their group which was treated with placebo alone compared to ours (56.6%) was probably because our patients had laxative as well. It is important to note that mere laxative therapy does not guarantee cure in functional constipation, however, high intake of fiber plays an important role in the successful outcome of medical therapy.

Most of the patients who showed little improvement with treatment had history of faecal incontinence. This supports the consideration of faecal incontinence as a negative factor for successful therapy[14].

In both adults and children, compliance with the use of fibre supplements is low because of adverse effects, such as abdominal pain and flatulence, and flavour of the supplements[18].

We did not notice these side effects in our patients who had good compliance in this study. A subset of patients with functional constipation may need longer periods of treatment and follow up.

In practice we noted recently that constipation in children is increasing in our community which may indicate a dietary changing behaviour, and this is an alarming sign which necessitates rapid action from social and public authorities.

Conclusion

Functional constipation is the most frequent cause of constipation in Sudanese children. Conjoin use of Gum Arabic with laxative in treating functional constipation is useful. Further detailed studies with longer follow up periods are required.

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