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Review Of Functional Constipation in Pediatric Age Group: A Retrospective Study

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Abstract

BACKGROUND: Constipation is one of the common disorders of childhood across the world. It is an issue for both the patient and family. Functional constipation easily diagnosed clinically and early intervention by family education, dietary habits manipulation, toilet training and laxative medication may induce complete resolution. OBJECTIVE: The aim of this study is to review and analyze the etiological factors, age, gender, demographic and socioeconomic status and also to review the treatment of functional constipation to assist the medical care providers in the management of constipation in the pediatric age patients in our country due to lack of literature and misunderstanding of the pathophysiology of functional constipation. METHODS: A total 128 consecutive children aging from 1 to 13 years, all with functional constipation, and any case associated with underling disease (organic constipation) were excluded, were reviewed and analyzed with related factors including age, gender, demographic, and socioeconomic status. Treatment was assessed with fallow up for 6 to 9 months in Al-Kadhimain Medical City, Baghdad, Iraq, from June 2018 to June 2021. RESULTS: A total of This study group were 128 patients, ages from 1 to 13 years and the mean age were 5.1 years, girls were slightly more than boys, female 72 (56.25%) and male 56 (43:75%), female to male ratio 1.28:1, the Peak incidence of constipation occurs at the early childhood preschool age: 57 (44.53%) patients aged from 3 to 5 years. 84 (65.62%) patients live in urban areas and 44 (34.38%) live in rural community. 79 (61.71%) patients came from families with low socioeconomic status. The commonest presenting feature was painful defecation, 109 (85.15%) presents with painful stool, and 98 (76.56%) patients complaining of episodes of fecal incontinence (encopresis) and 117 (91.40%) patients with history of low dietary fiber and fluid intake. The treatment was highly effective by education, dietary manipulation, behavioral changes, toilet training, and laxatives with close regular follow up in 113 (88.28%) patients but 15 (11.72%) patients had frequent relapse that need aggressive treatment. CONCLUSIONS: Functional constipation is common problem in children and most of the patients were cured by proper management. Variable times were required for the treatment and relapses are frequent. Education of the parents, dietary manipulation, toilet training, laxatives and proper follow up is the main issue in the management.

Keywords

Functional Constipation; Retrospective Study; Pediatric Age.

Constipation is a common problem in children. The prevalence of constipation in children range between 1% and 30%, 3-5% of pediatric patients in the outpatient, and about 35% of patients in the

pediatric gastroenterology clinic. [1,2,3,4,5,6] The highest incidence of constipation occurs at the early childhood (preschool age) which is the time of transition to solid foods and toilet training.[7,8,9] Functional constipation is equally common in both sexes, children from different socioeconomic status , educational levels, and dietary habits .[10] The functional constipation is infrequent stool evacuation passing hard stool or painful stool with no underlying organic causes.[11] Functional constipation accounts for more than 95% of cases of constipation in children.[9]

The diagnostic Criteria for Functional Constipation, Must include 2 or more of the following occurring at least once per week for a minimum of 1 month: [10]

1. 2 or fewer defecations in the toilet per week
2. At least 1 episode of fecal incontinence per week.
3. History of retentive posturing or excessive volitional stool retention.
4. History of painful or hard bowel movements.
5. Presence of a large fecal mass in the rectum.
6. History of large diameter stools that can obstruct the toilet.
7. The symptoms cannot be fully explained by another medical condition.

When the child avoid defecation due to painful stool or other social cause like school or market , as a consequence of the withholding , the colon absorbs water from the fecal material and the retained stool become not easy to pass. This process led to more stool retention resulting in distended rectum causing what we called overflow fecal incontinence and soiling (encopresis) due to loss of rectal sensation and loss of normal urge to defecate. Distended rectum filled with stool leads to decrease the motility of the foregut causing anorexia, abdominal distention and abdominal pain.[7,10]

The diagnosis of functional constipation depends mainly on proper history and physical examination, and not forget alarm signs and symptoms that indicate underlying disease causing the constipation.[10]

There are four phases in the management of functional constipation: education, disimpaction, maintenance to prevent re − accumulation of feces and follow up. Education of the family is highly important as medication in the treatment of functional constipation by early recognizing painful defecation and withholding and rewording system for easy evacuation.[10,12] Encourage adequate intake of dietary fibers and fluid is essential and highly recommended.[10,13,14,15,16] The medication that used in the disimpaction either rectal or oral route. The oral route is non-invasive and better tolerated.[17,18] The rectal approach is faster but invasive and traumatic.[17] Maintenance treatment to prevent re accumulation of the fecal material and many medications are used all over the world but polyethylene glycol is the first line therapy in children.[10,19] Polyethylene glycol was reported to be superior to lactulose.[3,10,20,21] Polyethylene glycol is the medication of first choice for both disimpaction and maintenance therapy. [9]

About 50% of children that treated and fallowed for 6 to 12 months recovered completely and stop the use of laxatives.[10, 22,23]. Polyethylene glycol make the constipated child improved and make the children had less fecal soiling, painful defecation and fecal impaction,[9,24,25,26] Polyethylene glycol 3350 with or without electrolytes in a dose of 1−1.5 g/kg/day for 3−6 days is the first-line therapy for disimpaction.[17,27,28,29] Glycerin suppositories are a safe and effective choice for disimpaction in infants [18] and Bisacodyl suppositories can be used for older children.[29]

In the Maintenance therapy, the most commonly used and most effective laxative is polyethylene glycol 3350 (0.4−0.8 g/kg/day) with or without electrolytes.[13,28,30,31] Lactulose is the preferred alternative if polyethylene glycol is not available.[32,33] Pashankar et al failed to find any side effects following PEG therapy. PEG has not altered the serum electrolyte, osmolality and albumin levels of plasma and liver and renal functions[34].

Methods

Our study is cross sectional retrospective study carried out in Al-Kadhimain Medical City, Baghdad − Iraq, which is a tertiary hospital , from June 2017 to June 2021. A total number of the patients included in this study were 128 patients aged from 1 to 13 years, all of them were affected with functional constipation. Patients presented with constipation due to organic disease, like bowel disease, anorectal disease and previous surgery were excluded from this study. We take full history and extract the age , gender, living location, the family socioeconomic status and dietary habits and fiber intake. We apply the Diagnostic Criteria for Functional Constipation : when the patients had history of passing 2 or less number of defecations per week, painful or hard stool, large diameter stool difficult to pass that seen by parents on defecation, withholding and avoid defecation, history of fecal incontinence and soiling (encopresis). Then proper physical examination and anorectal examination to confirm the diagnosis and exclude the cases of constipation due to organic cause. Cases that their parents refuse to continue in regular follow up and refuse to share in this study were excluded from this study. Regular follow up was done by one visit every 2 weeks in the first 2 months and then monthly for 7 months to assess the management .

Results

The total number of the patients included in this study were 128 patients aging from 1 to 13 years, and the mean age was 5.1 years. The distribution of the patients according to the age were variable in number shown in (figure 1). The demographic features and other medical data are described in (table1).

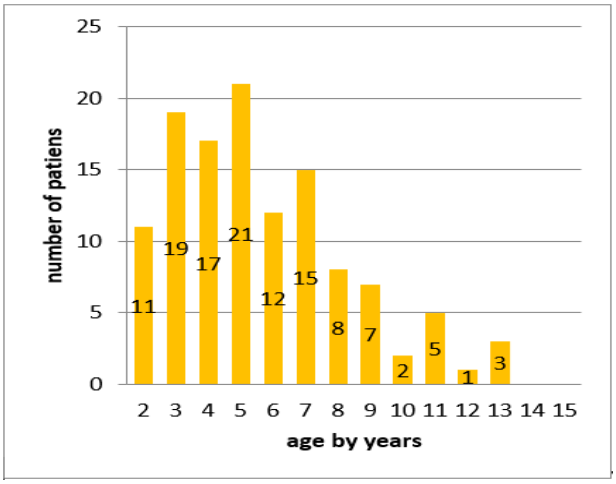

Figure 1. Distribution of the cases according to the age of the patients.

Table (1). Demographic features and other characters in patients with functional constipation in pediatric age group.

Criteria	Number of patients
Total number of patients	128
Age	1 – 13
Mean of age	5.1
Gender: - Female - Male	 72 (56.25%) 56 (43:75%)
Female to male ratio	1.28: 1
Age of Peak incidence	3 – 5
Community: - Urban - Rural	 84 (65.62%) 44 (34.38%)
Patients with low socioeconomic status	79 (61.71%)
Patients with painful defecation	109 (85.15%)
Patients with fecal incontinence (encopresis)	98 (76.56%)
Patients with low dietary fiber and fluid intake	117 (91.40%)
Fate of treatment: - Treatment highly effective - Frequent relapse need aggressive treatment	 113(88.28%) 15 (11.72%)

Female were slightly more than male. The number of female patients was 72 (56.25%) and male patients' number was 56 (43:75%) with female to male ratio 1.28:1. We find the highest incidence at the age of 5 years (21 child affected), then 19 patients at the age of 3 years and 17 patients at 4 years of age. The summation of patients aging from 3 to 5 years were 57 (44.53%) patients. So the Peak incidence of constipation occurs at the early childhood preschool age 3 to 5 year.

84 (65.62%) patients lived in urban areas and 44 (34.38%) lived in rural community. 79 (61.71%) patients came from families with low socioeconomic status. The commonest presenting feature was painful defecation which was found in 109 (85.15%) patients. 98 (76.56%) patients complaining of episodes of fecal incontinence (encopresis) and the parents described that by smelling bad offensive odder and they found just small amount of feces around the anal verge and sometimes small amount just paint the clothes and anal verge with offensive odder.

A high prevalence was found in children with low dietary fiber and low fluid intake <117 patients (91.40%)> and they consumed daily large number of sweets, chips, milk and junk food with low consumption of fiber, fruit, vegetables and fluids.

The strategy in the management of the patients in this study had many facets: first is education to induce dietary manipulation, behavioral changes and toilet training, second is disimpaction by uses of osmotic laxative Polyethylene glycol 3350 with electrolytes at a dose of 1 to 1.5 g/kg/d, for 3 days and Bisacodyl suppository 10 mg/suppository half to one suppository according to the age in combination after breakfast to get a benefit from gastro – colic reflex, third is prevent recollection by Polyethylene glycol 3350 maintenance dose of 0.75 g/kg/d for 1 to 2 months until the constipation completely resolved and weaning of laxatives is gradual and relapses treated by the same way, and fourth is regular proper follow up every 2 weeks in the first 2 months and then once monthly to complete 9 months. These four facets of management was highly effective in 113(88.28%) patients but 15 (11.72%) patients had frequent relapse that need aggressive treatment by combination of Polyethylene glycol and lactulose in addition to bisacodyl suppository when disimpaction is mandatory.

Discussion

The aim of this study, like other studies[6,17], was to highlight on Functional constipation prevalence, diagnosis and management in order to improve overall outcomes.

In a study in 2010 from south Korea by Chung on age group 5-13 years, they found that female to male ratio was 1.4:1 in (A) and 1.5:1 in (B)[35]. In

other studies, functional constipation is slightly more common in girls.[9,36] which is similar to data in our study that show girls were slightly more than boys (female 72 (56.25%) and male 56 (43:75%) with female to male ratio 1.28:1.

In this study, the Peak incidence of functional constipation occurs at the early childhood preschool age, 57 (44.53%) patients aged from 3 to 5 years, which is like other studies that confirm the peak prevalence at the age of early childhood preschool period. [6,7,8,9] this is may be due to the fact that at this period the child change to solid food and a time for toilet training.

In this study, about two third of patients from urban community, 84 (65.62%) patients live in urban areas and 44 (34.38%) live in rural community, which is different from other study that showed 59.65% came from urban areas and 40.35% came from rural areas. [37] However, the difference is of no statistical significance. The cause of low prevalence in rural area were multifactorial like high fiber diet containing fruits and vegetables in rural and delay in diagnosis due to poor economic and educational level far away from the center.

Different data from one of the studies say functional constipation is equally common in both sexes, children from different socioeconomic status, educational levels and dietary habits. [10] This mean that there is no effect of socioeconomic status on the prevalence of functional constipation. However, in our study, 79 (61.71%) patients came from families with low socioeconomic status which is in agreement with other studies. [9,38,39]

In this study, the commonest presenting feature was painful defecation. 109 (85.15%) patients presented with painful stool which is similar to other studies. In most cases, the initiating event is a painful defecation which leads to voluntary withholding of stools. [17] The passage of these larger and harder stools causes more pain. [40]

There is variable data on the prevalence of fecal incontinence (encopresis) in different studies. Actually, the studies concerning encopresis were scanty. Encopresis is defined as a disorder characterized by repeated stool evacuation in inappropriate places in children over the age of four.[37] One of the studies find Up to 84% of the children with chronic constipation experience frequent episodes of fecal incontinence [41] and in the another study the result was fecal incontinence was associated with constipation in 95% of children.[42] In this study, the result was 98 (76.56%) patients complaining of episodes of fecal incontinence (encopresis). This could be due to the fact that low educated family's denial the soiling of their child and they feel socially that it is shame for the family and this made the registered cases less than actual number.

In our study, the result was 117 (91.40%) patients with history of low dietary fiber and fluid intake and this result was confirmed by many studies such as one study in Japan which showed a higher dietary fiber intake was significantly associated with a lower prevalence of constipation and Inadequate fluid intake may cause hardening of the stool and is an important cause of constipation[43]. Similar results were found in many other studies.[14,15,44,45,46,47,48]

In this study, the management is highly successful by education, laxatives for disimpaction and maintenance and follow up in 113 (88.28%) patients out of 128 patients. However, 15 (11.72%) patients had frequent relapse that need aggressive treatment. These results were in agreement with the results of other studies. [3,9,10,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34]

Conclusions

Functional constipation is common problem in children. It diagnosed clinically and most of patients were cured by proper management. Variable times were required for the treatment and relapses are frequent. Education of the parents, dietary manipulation, toilet training, laxatives and proper follow up is the main issue in the management.

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