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Original Article

The Effects of Administering the Bowel Management Program in the Treatment of Fecal Incontinence Among Children With Chronic Refractory Constipation

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Abstract

Objective: Constipation is a prevalent issue among children and is generally treatable with simple therapeutic approaches. However, a considerable proportion of these children experience severe constipation that necessitates more invasive treatments, including surgical interventions. This study is designed to examine the effects of administering the Bowel Management Program (BMP) in the treatment of fecal incontinence and soiling among children with chronic refractory constipation.

Materials and methods: The research involved 24 patients who presented at the Children's Medical Center exhibiting symptoms of functional constipation and fecal incontinence. Each patient was enrolled in the study after a thorough review of their medical history, a physical examination, and other paraclinical measurements like barium enema or rectal manometry, ruling out the organic causes of constipation. The bowel management program was subsequently established for these patients.

Results: This study examined 24 children, including 14 girls (58.3%) and 10 boys (41.7%), with a mean (SD) age of 4.8 (1.2) years for the girls and 5.4 (1.2) years for the boys. The analysis revealed that there was no significant correlation between symptom duration and treatment duration in relation to gender, as indicated by a p-value greater than 0.05. Spearman's correlation test showed a significant relationship between the children's age and their treatment duration ($p<0.001$, $r=0.54$) and also between their age and their clinical symptom duration ($p<0.001$, $r=0.59$).

Conclusion: The results showed that the children's age was significantly correlated with their treatment duration and clinical symptom duration. The bowel management program can be an effective treatment for overflow incontinence in children with chronic refractory constipation.

Keywords: Constipation; Children; Bowel Management; Fecal Incontinence; Enemas

Introduction

The North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) defines constipation as difficult or delayed bowel movements that persist for two weeks or more, leading to distress and anxiety for patients and their parents (1). The two major causes of constipation in children are categorized as Functional

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(idiopathic) and Organic. In more than 75% of cases, constipation is functional, and no organic causes are detected (2).

Generally, constipation is a transient condition with limited consequences; however, in some instances, it may extend beyond six months and remain unresponsive to conventional therapies, thereby being classified as refractory constipation (1).

Managing chronic constipation necessitates a comprehensive long-term strategy, typically spanning a duration of 6 to 24 months (3). Various approaches exist for addressing refractory idiopathic constipation, including dietary adjustments, pharmacological treatments, rectal enemas, Botulinum toxin injection, biofeedback techniques, psychotherapy, behavioral interventions, and, in some cases, surgical procedures (1, 4).

Despite the available therapies, some children do not respond favorably to these interventions and are hospitalized several times for bowel evacuation (5). The effective management of this condition is significantly influenced by the caregiver's role and the surrounding social environment in which the child lives (6).

Recently, the Bowel Management Program (BMP) has been implemented as an economical and non-invasive approach for addressing chronic idiopathic constipation (7). This approach ensures that patients receive comprehensive care, as the initial regimen is designed to address specific gastrointestinal concerns, while the follow-up appointments allow for ongoing assessment and tailored adjustments to their treatment as needed (8-12).

Research on the administration of BMP has been encouraging, however, it is important to note that they have reported the short-term outcomes related to BMP, but there is a lack of evidence in the literature focusing on the long-term implications of these interventions (8-12).

The current investigation is motivated by the lack of literature addressing the specific needs of children with chronic refractory constipation and fecal incontinence who have failed to respond to the typical treatment methods. By examining the potential role of BMP, this study aims to assess the effectiveness of this alternative therapeutic option in the Iranian patient population.

Materials and methods

This cohort study was conducted between 2017 and 2020 on children over 4 years of age who presented with refractory constipation and fecal incontinence at the surgery clinic of the Children's Medical Center at Tehran University of Medical Sciences.

Study Participants: As complete fecal control is achieved after the age of 3 years, the study initially included children older than 4 years who presented to the surgery clinic at the Children's Medical Center with refractory constipation that had not responded to standard treatment methods. Then, the patients were physically examined and underwent paraclinical assessments (using barium enema and rectal manometry in cases of clinical suspicion). Cases in favor of Hirschsprung's disease or anatomical disorders such as various types of anorectal malformation, and cases with medicinal or hormonal causes such as hypothyroidism according to the patient history were excluded. Finally, patients over 4 years of age with refractory constipation and overflow incontinence were included in the study.

In the course of the first visit, if the physical examination indicated signs consistent with fecal impaction, such as the palpation of a fecal mass in the abdomen or the presence of hard stool in the rectal ampulla that could not be evacuated, as confirmed by plain abdominal radiography, the patient was hospitalized for disimpaction. Once the disimpaction was confirmed, the research protocol was presented to the parents, who were given practical training and were also informed of their essential role in the successful administration of the treatment.

The procedure would begin half an hour after a complete meal at a set time every day. The parents are instructed to place the child in a left lateral position and to gently insert a Nelaton catheter, either size 14 or 16, into the rectum, advancing it upward by about 10 centimeters. Subsequently, depending on the child's age, an enema consisting of 250-300 cc of tepid water is administered, while the child maintains the same position for five minutes. After this duration, the child is then taken to the toilet for fecal evacuation. In this approach, it is advised that the child either waits until the bowel is completely emptied or remains seated on the toilet for a duration of 10 minutes. To avoid discomfort from holding the child in the evacuation position for a long time, it is recommended to use a kid butt wash basin or a suitable toilet seat. The child can also be given toys to keep busy with and continue to sit for the evacuation process to be completed. A PEG laxative was also prescribed for the child.

This protocol must be performed on a daily basis during the first month. In the second month, it must

be performed every other day at the same set of times. Follow-ups were conducted at the clinic during the second month, and if soiling had resolved and daily defecation had become normal in the patient, enema was given twice weekly in the third month and laxative was continued until the end of the third month. If the patient responded to the treatment, enema and colonic lavage continued for only three months and laxative supplementation was continued for a month after terminating the enema.

If the patient had not responded to the treatment, the enema treatment continued daily or every other day for a maximum of six months depending on the abnormal frequency of defecation and soiling. The use of laxatives continued for a month following the discontinuation of the enema. The desired outcome for treatment response is that the child has fecal evacuation at least twice per week without experiencing pain, discomfort, or soiling of their underwear.

Additional information necessary for the execution of this study was extracted from the archived patients' files at the clinic. The extracted data including the age, gender, symptom duration, and clinical symptoms of the patient were recorded in a data sheet designed by the researcher.

Details of the research method and procedure were submitted to the Medical Ethics Committee of the Tehran University of Medical Sciences, and the study was carried out after the committee's approval was received.

Statistical analysis of the recorded data was performed using IBM SPSS software version 24. First, Initially, the Shapiro-Wilk test was employed to assess the distribution characteristics of the data. Fisher's exact test was employed to evaluate the relationship between two categorical variables. The Mann-Whitney U-test was used to assess the difference between numerical and categorical variables. The analysis of the association between quantitative variables was conducted via the Pearson test. The study set the criterion for statistical significance at a P value below 0.05.

Results

This study was conducted on 24 children, including 14 girls (58.3%) and 10 boys (41.7%), with a mean (SD) age of 4.8 (1.2) years for the girls and 5.4 (1.2) years for the boys.

The Shapiro-Wilk test was used to check the data distribution, which showed that the data was normally distributed.

The findings from Fisher's exact test indicated that there was no significant association between gender and the results of the barium enema (P=0.439) or manometry (P=0.617). The Mann-Whitney U-test indicated that there was no significant relationship between symptom duration (P=0.312) and treatment duration (P=0.084) in relation to gender (Table 1).

The results of Spearman's correlation analysis indicated a significant association between the age of the patient and the duration of their treatment, revealing a correlation coefficient of approximately 54% (p< 0.001). This finding suggests that as the age of the patients increases, so does the length of their treatment (Figure 1).

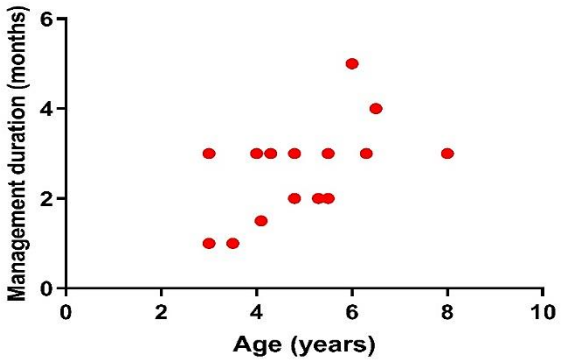

Figure 1: The correlation between the patient's age and the required treatment duration

Table 1: The association between patient's gender, and Barium-enema, symptom duration, and treatment duration

Parameters	Girls	Boys	Total	P-value
Barium-enema, n (%)				0.439
NL	4 (28.6)	4(40)	8 (33.3)	
NO	10 (71.4)	6 (60)	16 (66.7)	
Total	14 (100)	10 (100)	24 (100	
Symptom duration (months), Mean (SD)	12.5 (6.5)	15.9 (8.4)	13.9 (7.4)	0.312
Treatment duration (months), Mean (SD)	2.4 (0.64)	3.3 (1.3)	2.8 (1.0)	0.084

NL: Normal, NO: Not performed

A significant relationship was also observed between clinical symptom duration and the age of the children, as the correlation between the two variables was around 59% ($p<0.001$). In other words, clinical symptom duration increases with age. No significant relationship was observed between symptom duration and the required treatment duration (Figure 2).

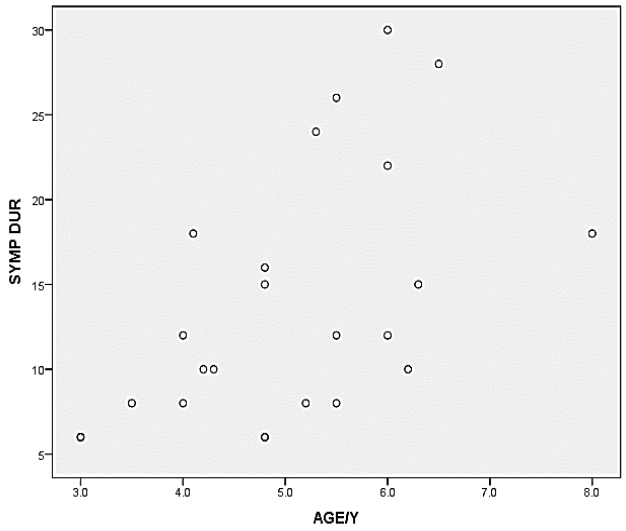

Figure 2: The correlation between the patient's age and clinical symptom duration

Discussion

The present study aimed to investigate the effectiveness of administering the bowel management program in treating fecal incontinence in children with chronic refractory constipation. The results showed that gender is not significantly correlated with barium enema, manometry, symptom duration, and treatment duration, but a significant relationship was found between the child's age and the duration of treatment. It can be concluded that a significant percentage of children with refractory constipation can benefit from BMP, and it appears that older children require a more extended treatment period. In addition, the results of the study showed that there was a significant correlation between the child's age and the duration of the clinical symptoms. This observation implies that the manifestation of the disease persists longer among older children compared to their younger counterparts.

Chronic constipation is common in children and is considered the most common functional GI disease in this age group (13, 14). The results of most studies were consistent with the findings of the present study. A retrospective study investigated the effects of BMP in 700 pediatric patients for more than 30 years and found that the treatment was successful among 95% of the patients (15). Levitt et al. (2009) also investigated fecal incontinence in children and treated them with a specific protocol. Their one-week-long protocol aimed to keep the colon clean over 24 hours without incontinence using daily abdominal X-rays. The positive response rate by patients was 95% (16).

Richard J. Wood et al. (2021) found that BMP is an effective method of treating fecal incontinence in children (12). Shaman Rajindrajith (2011), however, stated that there is no significant relationship between the treatment duration for refractory constipation in children, and age of symptom onset, family history, and frequency of evacuations (17).

The research findings by Mogi et al., Liberrizi et al., and Gheibi et al. revealed a significant relationship between the children's increased age and readmission to the hospital. It can be concluded that their findings align with ours. Therefore, age must be considered as a risk factor for resistant constipation and readmission in children (18-20). Hence, action must be taken to make an early diagnosis and timely treatment of constipation in children at a young age. Educating parents on this matter could prove to be advantageous. By providing them with the necessary knowledge, parents can better understand the importance of early diagnosis and their role in the treatment outcomes (6).

It is important to recognize that our investigation encountered certain limitations. Such limitations should be taken into account when interpreting the outcomes. Our study exclusively involved children aged four years and older, and we did not specify the prevalence of constipation according to age for different genders. Discrepancies can be attributed to the short duration of our study and fewer participants. Meanwhile, our research represents one of the pioneering investigations focused on the Iranian pediatric demographic experiencing chronic refractory constipation. This study contributes to a limited body of literature addressing this specific health issue within this population in Iran.

Conclusion

The bowel management program (BMP) can be an effective way of managing fecal incontinence in children with chronic refractory constipation. The present study found a significant relationship between the children's age and treatment duration, as well as the children's age and their symptom duration.

Conflict of Interests

Authors declare no conflict of interests.

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