

Daily anal stimulation for newborns with severe functional constipation

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Abstract

Objective : One of the most prevalent issues in juvenile gastroenterology is functional constipation. The purpose of this research was to determine whether daily anal stimulation is helpful in treating infants with persistent functional constipation. (IFC). Our assessment was based on both clinical advancement and modifications to manometric measures over time.

Methods : This retrospective analysis included infants with IFC who received treatment between January 2018 and December 2019. Daily anal stimulation for infants was part of the treatment procedure, and parents received psychological counseling. Within a year of follow-up, all cases received a thorough intervention program and were assessed for symptom improvement and changes in anorectal manometry.

Results : This research included 161 patients in total. All individuals showed signs of improvement. All infants experienced a substantial reduction in frequency of feces, a change in stool consistency,

and defecatory pain following intervention. On anorectal manometry, there was no discernible change between the distal rectum's peristaltic frequency before and after the treatment. After the intervention, there was a significant improvement in the rhythm and a rise in the mean amplitude of peristalsis. Three patients required a colectomy after experiencing diarrhea again during the 1-year follow-up period.

Conclusion : Daily anal stimulation may be incorporated into the beginning phase of an intervention program for IFC in infants due to its high clinical efficacy and negligible side effects.

Introduction

Functional constipation in children (FC) is a prevalent clinical issue that is frequently observed in the first year of life. The Rome IV criteria reflect the extensively used method for diagnosing FC in the pediatric age group. Symptoms include irregular, painful urination and/or the passage of hard stools.³ Infants with FC continue to require challenging care. Laxatives and oral probiotics are among the treatments that are available to ensure painless defecation, which is an essential component of therapy.³ However, some babies have persistently severe symptoms that don't improve with standard dietary and medical management, and these infants are thought to have intractable FC. (IFC) ⁴.

Numerous studies have discussed alternative therapies for FC in teens or adults, including potty training, biofeedback, and other forms of intervention, and the results were almost noticeably better.^{5 6} However, there are few experiences with and accounts of these therapies in infants. This study's main objective was to assess the clinical utility of everyday anal stimulation in infants with IFC.

METHODS

Study population

The children constipation outpatient clinic of our institution, a top university hospital in China, treated consecutive infants with chronic constipation based on the Rome IV criteria³ between January 2018 and December 2019. ClinicalTrials.gov recorded the study. (registration number: NCT01985646). Every process complied with the Helsinki Declaration. No patients or members of the general public were engaged in the planning, execution, reporting, or

dissemination of our study.

Following were the conditions for inclusion: (1) Rome IV criteria-based diagnosis of FC at a young age; at least two of the following issues had to have been documented in accordance with these criteria: two or fewer defecations per week, a history of excessive stool retention, painful bowel movements or hard bowel movements, and large-diameter stools, and the presence of a large fecal mass in the rectum³; (2) received or were receiving medication treatment (lactulose and probiotics and others) by their primary gastroenterologist, but were dependent on the medications or unresponsive to medication treatment with persistence of constipation for at least 1 month. These factors were used to exclude people: (1) constipation due to organic causes diagnosed by histopathology or anorectal manometry (ARM) examination, such as Hirschsprung disease (HSCR) or internal anal sphincter achalasia (IASA), and so on; (2) personal history of anorectal malformation; (3) family history of inflammatory bowel disease, HIV infection, neurologic or psychiatric disorder, and so on.

Treatment protocol

All the treatments were conducted on an outpatient basis. All the parents were educated about the study protocol after which written informed consent was collected from all participating parents. The intervention program included daily anal stimulation for infants and psychological counseling for parents.

Every single therapy was delivered in an outpatient setting. Following an explanation of the study's protocol to all participating parents, their written informed permission was obtained. The intervention program included psychological therapy for parents as well as daily anal stimulation for infants.

Anal agitation

Anal stimulation with a particular bougie was used to encourage routine defecation in babies with IFC. The bougies were made of plexiglass and ranged in diameter from 11 to 22 mm, measuring about 21 centimeters in length. (F11–F22). The bougies were chosen prior to therapy based on the patient's anal size as found by a digital rectal examination. The suitable bougie was first gently inserted into the anus for a depth of between three and five centimeters while being coated in paraffin.

Infants' typical, evident bowel movement patterns can be seen, including gassing out, groaning, crying, or making other distress-related noises, as well as an effort to push the bougies out of the anus. While doing this, the caretaker made baby music sounds and massaged his abdomen in a clockwise motion, which

helped him defecate easily by promoting intestinal peristalsis.⁷

Patients received consistent everyday intervention for a minimum of one month and a maximum of three months. Each intervention ran between five and ten minutes. All the involved patients were contacted for monthly clinical visits up until a year of follow-up as part of the training program and to improve compliance.

Psychological therapy

Parents or caregivers were given health education and relevant materials to help them fully grasp the pathophysiology of FC. Diagrams were used to explain the complete intervention procedure. The parents and caregivers were given the chance to discuss any concerns they had about the nursing process. The significance of compliance was also conveyed to the parents.

ARM treatment

ARM (Medical Measurement Systems, Netherlands) was done prior to the treatment courses, with the patient lying down and an 8-channel water perfusion catheter. The catheter was inserted into the anal canal, and manometric parameters such as the rectoanal inhibitory reflex (RAIR) threshold, peristaltic frequency and amplitude of the distal rectum, and anal canal pressure at rest were recorded.

All children underwent ARM at the time of presentation, and the findings were compared with those from a follow-up manometry test that was carried out within a month of the intervention. The same operator carried out each operation.

outcomes assessed

The main result was a shift in the frequency of bowel movements. Changes in stool form, the frequency of Defecatory Pain, and an increase in ARM parameters were among the secondary outcomes.

Statistic evaluation

Statistics were used to analyze each pretreatment versus posttreatment outcome. In order to analyze categorical variables, the χ^2 test was used. Continuous data were given as the meanSD. (large-diameter stools or painful defecation). For continuous data, such as stationary pressure, RAIR threshold, and peristaltic flow, the Student's paired t-test was used to determine whether there were differences in the ARM parameters between the groups.

RESULTS

The research included 161 infants with IFC in total. At each follow-up appointment, patients' complaints were also assessed. The majority of patients responded favorably during the first year of follow-up, but three patients (0.02%) experienced a return of diarrhea. At around 2 years old, these patients received a radical colectomy. Intestinal neuronal dysplasia (IND) was found in two patients' removed colons, and hypoganglionosis was found in one patient.

Analogous manometry

We discovered that all infants had RAIR after looking at the anal sphincter relaxation. Before and after the treatment, the RAIR was present at the mean threshold volume needed to trigger it (13.387.38 vs. 11.625.02 mL, $p=0.15$). Before and after the therapy, the mean anal resting pressure was 64.4721.3 and 66.6120.3 mm Hg, respectively. The distal rectum's peristaltic frequency was compared before and after treatment, but no change was discovered. (figure 1). However, the distal rectum's peristaltic amplitude showed a noticeably positive reaction. Following intervention, the mean peristalsis amplitude increased from 7.617 4.22 to 15.723 7.11 mm Hg, and the rhythm greatly improved.

DISCUSSION

Currently, the use of laxatives, dietary changes, behavioral counseling, and other methods are the main components of FC treatment.² Probiotics and oral and/or rectal laxatives are the first-line treatments for fecal impaction in newborns.⁸ However, IFC patients frequently experience relapses, and their symptoms frequently linger.⁹ Numerous areas of life, such as social interactions, academic success, and self-esteem, are negatively impacted. Finally, many centers decided whether to perform surgery on infants with IFC ^{4 10}.

The best age for toilet training babies is still up for debate between eastern and western nations today.¹¹ Early toilet training is common in Chinese society because it gives parents more time and allows them to teach their children about the sensations associated with urination.

for the infant to become accustomed to toilet training and eases the shift for them to independent toileting.¹² The "infant toilet training" method used to get a lot of press, but it was rarely used in regular clinical practice and wasn't covered in the written guidelines¹³. The toilet training program was initiated in the present study as early as 3 months of age. During the

observation period, we discovered that the majority of infants benefited from stimulating defecation and promoting intestinal peristalsis. They were also taught to control their stools on their own, including the muscles used for defecation, and to develop a defecation reflex.^{14 15} Clinically, the capacity for defecation regulation and coordinated contraction of the rectal muscles with sphincter relaxation becomes more developed.

Rectal compliance, pressure changes, and anorectal feelings can all be evaluated effectively with ARM.¹⁸ In order to identify potential changes in the dynamics of defecation and the anorectal neuromuscular functions both before and after intervention, we evaluated the manometric parameters in infants for this research. To rule out HSCR and IASA, it is critical to note that all infants had intact RAIR. Before and after the operation, peristalsis in the distal rectum occurred at about the same rates. However, prior to surgery, the peristaltic wave of the distal rectum was disorganized, had a slow, irregular shape, and had a low amplitude. The amplitude of peristalsis considerably increased after the intervention, and the rhythm also significantly improved.

Throughout the first year of follow-up, all patients received monthly clinical visits to support the management program and to improve compliance. We discovered that the majority of patients experienced improvements in defecation that lasted at least a year, indicating that the toilet instruction had a positive effect. Three patients needed colectomies after experiencing symptoms again after six months. On the basis of the resected colon's histopathology, two of these individuals had IND, and one had hypoganglionosis. These are uncommon congenital neuronal intestinal malformations that are categorized as HSCR variations.

According to this research, daily anal stimulation may be a useful technique for the management of infants and is one of the treatments for the early toilet training program (as early as 3 months of age).

The current research had some restrictions. Retrospective single-center research was the primary restriction, followed by an uncontrolled study and a brief period of follow-up that also restricted our findings. Future prospective randomized controlled trial studies are therefore necessary to confirm our findings and enhance the results even further.

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