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Abstract To evaluate the effect of education in children with chronic defaecation problems, a prospective 6-week intervention study was designed. A total of 54 children (5–14 years) underwent an education programme, with demystification of symptoms and advice about diet and toilet training. The present treatment was continued. After 6 weeks, children with persistent problems received biofeedback training with a follow up of 1 year. The intervention programme was successful in 8 children (15%). Biofeedback training was successful in 49% of the remaining group after 1 year.

Conclusion A total of 15% of the children with chronic defaecation problems seen at a referral centre could surprisingly be helped by a simple education programme with, demystification and toilet training. Further studies evaluating treatment in children with defaecation problems should account for the primary effect of these measures.

Key words Biofeedback training · Defaecation problems · Demystification · Education · Toilet training

Introduction

The treatment of defaecation problems in children is often based on a multifaceted programme [8, 10, 15, 18, 26, 28]. Generally, diet advice and physical exercise are important ingredients in the treatment of patients with defaecation problems. In "simple" and often acute constipation about 50% of patients are successfully treated by increasing dietary fibre to 20–30 g/day [7, 13, 26]. Although some suggest that no regimen is effective without initial enema treatment [27], others show comparable effectivity without enemas [8, 12]. Similarly, some suggest that abnormal defaecation dynamics, i.e. the inability to relax the external anal sphincter during defaecation, is a major but treatable factor in childhood constipation [2, 11, 16, 17, 21, 29]. Reconditioning of bowel habits is an important factor in the treatment of children with defaecation problems since many children spend too little time on the toilet [13, 18, 26, 28]. It is suggested that toilet training 5–15 min after each meal benefits from the gastrocolic reflex and thus reconditions the bowels [13, 24].

Education and demystification of the anorectal dysfunction is important in children with faecal incontinence. Many parents require reassurance that their child has a benign disease or need to know that the symptoms of their child are not harmful and are common among children with defaecation disorders [1, 13, 22, 26]. Such education increases confidence and competence of both the child and parents [26]. Faecal incontinence often results in punishment and many children are often teased before medical attention is sought [26]. A positive and nonaccusatory approach is therefore essential [24, 25, 28]. Such counselling and anticipatory guidance are supported by a study showing positive effects on eating habits and toilet training in otherwise healthy underprivileged children [9]. Although education, demystification and regulation of bowel habits during treatment is often mentioned, their roles have never been studied separately. Therefore, we evaluated the effect of one visit including a nonaccusatory, positive approach with diet advice and toilet training in children with chronic defaecation problems.

Patients and methods

Children with constipation and encopresis were referred by general practitioners, school doctors and paediatricians to the paediatric

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intestinal motility unit for biofeedback training. Unfortunately, biofeedback training is labour and time intensive and resulted in a waiting list. To overcome this, we invited the parents and the child for a standardised introduction, encompassing a bowel history and explanation about the bowel problems in a nonaccusatory manner. Furthermore, the physiology of the anorectum was explained with simple drawings and during the physical examination standardised information was given about bowel function. Finally, diet and toilet advice were given, also in writing and the parents started a bowel diary. Total fibre intake was directed at 3 g/Mj per day. Oral laxatives as prescribed by their referring physician were continued. It was left to the parents to discontinue laxative treatment if their child improved.

Six weeks later, children returned for the biofeedback treatment. At this second visit, the bowel diary was evaluated and the standardised treatment protocol was started, including anorectal manometry, colonic transit time measurements as well as oral laxatives (Importal 5 g/10 kg body weight/day), enemas (Klyx 120 ml during the first 3 days of treatment or when defaecation was postponed for more than 3 following days) and biofeedback training.

Inclusion criteria

Patients were classified into two different clinical groups:

1. Constipation: meeting at least two of the four following criteria as published [25]: defaecation frequency < 3 per week; two or more soiling and/or encopresis episodes per week; production of large amounts of stool every 7–30 days and; a palpable abdominal or rectal mass. Constipated patients were divided in subgroups with or without faecal incontinence.
2. Solitary encopresis was defined as faecal incontinence without any other criteria of constipation [3, 4, 14]. Children with organic causes of faecal incontinence such as, muscle disorders, spina bifida, anal atresia and Hirschsprung disease or mental retardation were excluded.

Soiling was defined as the loss of loose stools in the underwear. Encopresis was defined as the passage of a normal bowel movement in the underwear after the age of 4 years, occurring on a regular basis without any organic cause [14, 25]. Large amounts of stool were defined as twice the normal size of a clay model.

Anorectal manometry was performed, without bowel preparation with a perfused catheter as described previously [2].

Biofeedback training uses the anorectal manometry device and a computer screen to show, explain and teach normal anorectal manometric function. The sensory threshold was trained by inflating the balloon and the child was requested to contract the external anal sphincter whenever rectal sensation was perceived. Subsequently, the balloon was filled with 20 ml air, and the child was instructed to increase the abdominal pressure, to relax the external anal sphincter and to defaecate the balloon. By watching the computer screen and verbal reinforcement by the physician, the child was encouraged to accomplish an adequate expulsion attempt. Thereafter, the child was asked to bear down without visual and verbal feedback [2, 25].

Success was defined if patients fulfilled the following criteria: defaecation frequency 3 or more per week, soiling and/or encopresis < 2 per month and no use of laxatives.

The study was approved by the Medical Ethical Committee of the hospital and the child or parents gave written informed consent.

Analysis

For defaecation, soiling and encopresis frequencies and the duration of complaints, median values and ranges were calculated. Differences between the two groups were analysed using chi-square analysis. For all tests a level of 0.05 was used for significance.

Results

From February 1994 to August 1994 a total of 67 children with defaecation disorders were referred. Of these children, 59 fulfilled the criteria for either constipation or solitary encopresis. The other 8 children mainly had abdominal pain and did not meet the criteria for constipation. Of the 59 children, 10 (17%) were referred by general practitioners, 2 (3%) by school doctors and 47 (80%) by paediatricians, 73% were boys, median age was 8.0 years (Table 1). Most children had soiling and/or encopresis. In 34% of the children, the defaecation problems were primary, i.e. present from early childhood. The median duration of complaints was 45 months. As shown in Table 2, 12% of the children had not received prior laxative treatment. All other children did, often combined with dietary advice, toilet training, enemas or psychological treatment. A total of 51 children (86%) had received laxative treatment for at least 2 months and many were still using laxatives at the time of referral.

Two children were excluded after the waiting period; one underwent an appendectomy and another received antibiotics by the referring paediatrician. Three more

Table 1 Baseline characteristics of children with defaecation problems at the first visit

Baseline characteristics	Number $n = 59$	(% or range)
Gender (♂)	43	73%
Age (median)	8	(5–14)
Diagnosis		
constipation without faecal incontinence	4	6.8%
constipation with faecal incontinence	37	62.7%
solitary encopresis	18	30.5%
Duration of complaints (median months)	45	(2–150)
Primary defaecation problems	20	34%
Defaecation frequency/week (median)	4.0	(0–17)
Soiling frequency/week (median)	3.0	(0–21)
Encopresis frequency/week (median)	4.0	(0–42)
Production of large amounts of stool	33	56%
Abdominal pain	18	30.5%
Painful defaecation	7	12%
Palpable abdominal mass	4	6.8%
Palpable rectal mass	11	18.6%

Table 2 Previous treatment modalities (at least 2 months) of the referred patients provided by other physicians before the first visit at the motility unit

Treatment	Percentage
– Laxatives and dietary and/or toilet advice	33%
– Laxatives and enemas	39%
– Laxatives and other treatment i.e. psychology/homeopathy	16%
– Psychological treatment alone	2%
– No treatment	10%

children (all 5 years of age) were too anxious and did not co-operate with the anorectal manometry. All these children had persistent problems for at least 3 months of follow up.

Of the remaining 54 children, 8 children (15%) improved during the waiting period, such that they did no longer met the criteria set in the study and no further treatment was needed. During follow up, laxatives were reduced and stopped within a few weeks in five children. This group encompassed 7 boys and 1 girl, five were referred by paediatricians. Their median age was comparable with the children who continued with biofeedback training. The clinical improvement was observed in children with constipation (with or without soiling/encopresis) and in children with solitary encopresis, 6 were previously treated with laxatives. The median duration of defaecation problems in these successful children was 36 months compared to 50 months in children undergoing biofeedback training ($P = 0.77$).

The remaining 46 children with persistent defaecation problems were included in the 6 week treatment protocol, including laxatives, enemas, toilet training and 5 biofeedback training sessions. At the end of this intervention period six children (13%) were successfully treated. Of these, four had constipation and two had solitary encopresis. One child, which received biofeedback training without initial success, was lost to follow up at 1 year.

The success rate after a follow up of 1 year Table 3, was 62.5% in those children who improved during the waiting period, while the overall success rate of children treated with biofeedback training increased from 13% to 49%. In the constipation group success at 1 year was 47% and in the solitary encopresis group 55%.

Discussion

A nonaccusatory approach including education, demys tification and toilet training is important in the treatment of children with defaecation problems, especially in those with faecal incontinence [19]. However, the importance of these elements has never been established. Although a waiting list is unfortunate, it enabled us to evaluate the effect of one visit which concentrated on education, demystification, dietary and toilet advice in children with chronic defaecation problems. This study shows that such a visit is successful in 15% of the referred children with a relapse in one third.

Most children had constipation with faecal incontinence (63%) or solitary encopresis (30%), whereas only a minority had constipation alone. This suggests that faecal incontinence rather than constipation is important for parents to seek medical advice [5].

Importantly, before referral, most children had a median period of complaints of 45 months and were in the majority of cases already treated for their problems with several different treatment strategies. Almost all children had previously received laxatives often combined with enemas, dietary and toilet advice or psychological treatment. Therefore, these children, who in the vast majority were seen by paediatricians, can be classified as having severe defaecation problems. It is therefore interesting that in 15% of these children, success was achieved with a simple treatment strategy, emphasizing the importance of primary explanation and a nonaccusatory approach.

The success in the waiting period occurred in children with constipation as well as in those with solitary encopresis. However, we were not able to predict which children would improve on this approach.

Unfortunately, this study does not allow to separate the different aspects of the initial approach. It remains to be elucidated if the supportive nonaccusatory approach is more important than dietary and toilet advice. Some children may initially benefit from the nonaccusatory approach, resulting in major relief and a greater motivation. On the other hand, it cannot be excluded that motivation arised from the knowledge that intensive treatment with biofeedback training was unavoidable. Furthermore, a waiting list effect can not be excluded, although the time factor in these chronically constipated children is perhaps too short.

The treatment protocol for the children receiving biofeedback training was successful in both the constipation and the solitary encopresis group. The initial effect of 13% of biofeedback training was relatively ''low'' compared to other studies which showed at least 55% success [2, 6, 11, 25]. However, 15% already benefitted from the first visit and were subsequently not included for biofeedback training. This 15% effect is probably included in many other studies evaluating different treatment approaches including biofeedback training [2, 17, 23, 25, 29]. It should be stated that most children in the biofeedback group experienced great clinical improvement of their complaints but were still using laxatives and could therefore not be allocated to successful treatment. The duration of complaints was not related to the outcome, suggesting that this nonaccusatory approach should always be tried first. These findings sup-

Table 3 Success rate of the patients referred for defaecation problems after 1 year follow up. A standardised visit at the motility unit, encompassing a medical history, physical examination and diet- and toilet advice and positive reinforcement was followed by a waiting period of 6 weeks. Additional biofeedback training after the waiting period encompassed intensive treatment with laxatives and 5 biofeedback trainings, given in 6 weeks

Groups	Follow up (1 year)			
	Successful number	(%)	Unsuccessful number	(%)
Successful in waiting period (6 weeks)	5	(62.5%)	3	(37.5%)
Not successful biofeedback →training (6 weeks)	22	(49%)	23	(51%)
Total ($n = 53$)	27	(51%)	26	(49%)

ports the importance of a positive approach, education, demystification of symptoms, adequate laxatives and professional attention [20]. In the biofeedback group success at 1 year follow up is achieved in 49%, which is in accordance with other studies evaluating the effect of biofeedback training [2, 17, 25, 29]. However, a recent controlled study in children showed that although additional biofeedback training resulted in more children in normal defaecation dynamics, success rates were comparable to conventional therapy [25].

In conclusion, 15% of the children with long-standing defaecation problems seen at a referral centre can adequately be helped by a simple treatment programme including education, demystification and toilet training. This 15% initial success and an overall success of 51% using more sophisticated treatment such as biofeedback training, should encourage physicians treating children with defaecation disorders in their approach and treatment. Moreover, in further studies, evaluating certain treatment modalities in children with defaecation problems, it is important to assess or take into account, the primary effects of attention, education, demystification and toilet training.

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