Paediatric constipation and functional non-retentive faecal soiling

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Chapter 1

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Defecation disorders are very common in paediatric practice, form the most common complaint in childhood gastrointestinal disease, and result in 3% of all consultations to a paediatrician (1). The most frequent presented symptom in childhood defecation disorders is encopresis (2), defined as voluntary or involuntary faecal soiling of underwear in children older than 4 years (3). Constipation and functional non-retentive faecal soiling (FNRFS) are two major entities within paediatric defecation disorders. Paediatric constipation (PC) is characterised by a combination (2 out of 4) of: a low defecation frequency, encopresis, the passage of large amounts of stool and the presence of faecal retention found at physical examination (3). On the other hand, FNRFS refers to encopresis as an isolated complaint, in the absolute absence of constipation (4). A general introduction reviews the current knowledge on defecation disorders in childhood and introduces the reader to this topic (Chapter 2).

In more than 90% of patients with these two symptom complexes, no organic or anatomic cause can be found, and therefore these patients are considered to have a 'functional' defecation disorder (5). On the basis of symptomatology various criteria have been developed to define constipation and encopresis in children including strict 'classic' criteria. These 'classic' criteria were useful in evaluating endpoints of various treatment regimens (6,7). As several different diagnostic criteria are applied in the literature, many of these criteria are subjected to the personal interpretation of investigators. This makes comparison of different studies particularly difficult. In 1999, a group of experts in the field of paediatric gastroenterology and paediatric psychology made a first attempt to define uniform criteria for functional gastrointestinal disorders in childhood, leading to the first paediatric Rome II criteria (4). These criteria aim to provide a standardised definition of clinical disorders, allowing investigators from various fields to study the (patho-) physiology and treatment of the same disorders from different points of view. However, data on the validity / practical applicability of these 'new' criteria in children with defecation disorders are lacking. Therefore, we compared these new Rome II criteria with the 'classical' criteria (Chapter 3).

The pathophysiology underlying functional constipation is undoubtedly multifactorial, and not well understood. Difficulties in defecation can result from abnormal function of any of the different players involved, including the colon,
rectum, and the sphincter complex. In neurologically intact children the will of the child might also be involved in the pathophysiology. Genetic predisposition may play a role since constipation often dates back to the first months of life. Another indication for a genetic basis of the constipation is the presence of a positive family history in about 30% of children (8-11). Recently, delayed maturation of the interstitial cells of Cajal was suggested to be involved in the pathophysiology of constipation in two neonates with constipation and abdominal distension (12). Alternatively, severe behavioural problems might occur in older children, although these are usually mild and seem to be secondary to bowel dysfunction (13) and not the primary cause.

The barostat is a device which allows us to evaluate anorectal sensitivity, compliance, and the motility of hollow organs, like the rectum. Before the introduction of the barostat, several studies focused on the possible role of the rectum in paediatric defecation disorders using another technique. In these studies, sensitivity was tested by distension of the rectum with increasing volumes (i.e. anorectal manometry). Abnormal rectal sensitivity was reported in a substantial proportion (27%-78%) of children with constipation paediatric constipation (14,15). To date, it however becomes increasingly clear that pressure/tension, and not volume mainly determines visceral perception (16-18). This consideration suggests that the previous studies in children with defecation disorders using volume controlled rectal distensions (anorectal manometry) may have overestimated the role of impaired rectal sensitivity. Therefore, in order to get a better understanding of the true role of rectal sensitivity and to eliminate the influence of rectal compliance, we designed a study evaluating rectal function using a pressure controlled distension protocol applied by a barostat in children with PC and FNRFS (Chapter 4).

The role of rectal function was further investigated in a retrospective study in children who had longstanding constipation unresponsive to intensive medical and behavioural treatment. This group was compared with children who had suffered from constipation in the past, but were now completely symptom free. We hypothesized that an improvement in clinical status was reflected in an improvement in rectal function (Chapter 5).

Finally, not only disturbed rectal compliance / sensitivity but also abnormalities in rectal contractility may contribute to abnormal rectal function. During rectal function testing with the barostat we indeed observed the occurrence of rectal
contractions accompanied by unnoticed faecal loss in some FNRFS patients (unpublished observations). These rectal contractions were not followed by an adequate increase in anal sphincter pressure preventing faecal loss. We hypothesised that reduction of these rectal contractions could be a new therapeutic approach for FNRFS. In previous studies it was shown that loperamide, an opioid-receptor agonist, inhibits peristalsis by reducing the release of acetylcholine and prostaglandin during distension in vitro (19) and increases anal sphincter pressure (20). Therefore, we designed a pilot study evaluating the effect of rectal loperamide in an adult patient with therapy-resistant, longstanding, childhood-onset FNRFS (Chapter 6).

Paediatric defecation disorders represent the most common complaint in childhood gastrointestinal disease and have a significant impact on the health related quality of life (HRQoL) of these patients. Health-related quality of life (HRQoL) is often defined as the physical, social and emotional effect of health problems upon patients. Unfortunately, most of the HRQoL questionnaires are generic and not disease-specific. As a result, most generic instruments lack the sensitivity to measure small changes or specific problems (like encopresis) in patient groups. HRQoL is now an accepted outcome measure besides standard measures of physical disease activity. It offers complementary information that can guide in choosing the optimal treatment strategy, especially when more treatment regimes prove equally effective with respect to physical outcome. Because a disease specific HRQoL questionnaire is not available for patients with defecation disorders we developed such a disease-specific HRQoL questionnaire, the ‘Defecation Disorder List’, for children with chronic constipation or FNRFS aged 7 to 15 years (Chapter 7).

One of the reasons for a decrease in HRQoL lies in the absence of a truly beneficial therapy. Follow-up studies in constipated children have previously shown that a substantial group of patients remain to have constipation beyond puberty, despite therapy (9,21). At present however, there are no data available on the long term outcome in FNRFS. Therefore we performed a long term follow-up study in a cohort of patients who had taken part in two biofeedback studies at our department (Chapter 8).

Despite the prevalence of paediatric constipation and the enormous number of paediatric patients on laxative medication, no large (placebo) randomised controlled trials are available (22,23). Moreover, there is no information concerning the maximum dose, duration and long-term side effects of any compound used in the
treatment of childhood constipation. Therefore, the treatment of these children is symptomatic and mainly based on clinical experience. It consists of a behavioural intervention and oral and sometimes rectal laxatives. In the Netherlands the laxative of first choice is an osmotic laxative such as lactulose, a synthetic disaccharide. Disadvantages of disaccharides are side effects like flatulence and abdominal pain. Recently, low dosed polyethylene-glycol (PEG) has been suggested as alternative treatment in the treatment of constipation. PEG is a non-absorbable compound with high molecular mass. Uncontrolled studies indicated that low doses of PEG are a good alternative in the treatment of constipated children (24,25). However, there are no randomised controlled trials comparing the efficacy of PEG 3350 and lactulose in paediatric constipation. Therefore, we compared the clinical efficacy and safety of PEG 3350 (Transipeg®) and lactulose in a double-blind, randomised, prospective, multi-centre study (Chapter 9).
References


