Defecation disorders and chronic abdominal pain in children. Pathophysiology and treatment
van Ginkel, R.

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Outline

of

the

thesis
1 Introduction

Pediatric functional gastrointestinal disorders are recently (re)defined resulting in the Rome II criteria. Four subgroups have been identified: vomiting, abdominal pain, diarrhea and disorders of defecation. This thesis focuses on abdominal pain (functional abdominal pain and irritable bowel syndrome) and defecation disorders (functional constipation/functional fecal retention and functional non-retentive fecal soiling). Although it is important to define these entities on clinical grounds, pathophysiologic mechanisms underlying these disorders are largely unknown. Consequently, therapeutic regimens are often given on an empirical base and are not based on known causality. Moreover, large randomized therapeutic and follow up studies in these children are virtually lacking.

1.1 Aim of the thesis

Therefore the aim of this thesis is to elucidate possible pathophysiologic mechanisms underlying childhood constipation and chronic abdominal pain in children. In addition, therapeutic modalities based on these pathophysiologic mechanisms will be investigated and a longitudinal follow up of constipated children will be performed.

1.2 Outline of the thesis

A general introduction to pediatric defecation disorders and chronic abdominal pain is described in Chapter 1. The current Chapter 2 gives a short description of the outline of this thesis.

Many manometric studies have been performed in constipated children in order to search for abnormal anal sphincter function as a cause of childhood constipation. All available manometric studies showed a variable but relatively high percentage of constipated children who exhibited a contraction, in stead of a relaxation, of the anal sphincter complex during a defecation attempt compared with healthy volunteers. Therefore, it was suggested that this paradoxical contraction of the anal sphincter leads to accumulation of stool in the rectum and consequently to constipation. This hypothesis was supported by the often observed stool withholding behavior in constipated children.

Although previous studies evaluating the influence of biofeedback training on this aberrant sphincter contraction were positive (normalizing sphincter function and high success percentages), a large randomized study comparing conventional treatment (toilet training, diary cards, diet and oral laxatives in combination with enemas) to conventional treatment with an additional biofeedback training program, showed no difference in successful outcome between both groups. A drawback of this study was that the conventional treated group also underwent two manometric sessions at the start and at the end of the therapeutic intervention period in order to collect data concerning anorectal function. Because these manometric sessions could
have altered the suspected difference between these two study groups, another randomized study was conducted comparing the effect of the performance of two manometric sessions on success percentage compared to conventional treatment. These findings are described in Chapter 3.

Pathophysiologic and therapeutic studies in children with functional non-retentive fecal soiling are scarce. Until recently, these children, who lose normal amounts of stool in their underwear after the age of four, but have no other signs of constipation were usually considered as constipated. Apart from the same paradoxical contraction of the anal sphincter complex during a defecation attempt, as shown in constipated children, no further aberrant anorectal functions were observed. Moreover, almost all of these children showed normal colonic transit times. These clinical and diagnostic observations suggested that the use of laxatives might have a negative effect on the frequency of stool in their underwear in these children. In Chapter 4 the effect of laxatives on successful outcome in children with functional non-retentive fecal soiling is described.

Due to disappointing results concerning the effect of biofeedback training in children with defecation disorders, the search for other pathophysiological mechanisms was intensified and used research techniques might possibly need re-evaluation. For example, the determination of rectal volume as parameter describing rectal sensation has some disadvantages, such as a suspected age-dependency and a possible influence of rectal compliance on determined rectal volumes. At the same time a new research tool, the barostat, was introduced. This is an electromechanical computer-driven air pump, which emerged to be a valuable tool evaluating gastrointestinal tone, motility and thresholds for sensation in adults with abdominal pain and constipation. In children, the experience with either gastric or rectal barostat is limited. This opened new possibilities for the ongoing search for pathophysiologic mechanisms leading to constipation and functional non-retentive fecal soiling. Results of barostat studies in children with functional defecation disorders are described in Chapter 5.

The treatment of functional non-retentive fecal soiling in children is disappointing. After two years of treatment (diary, toilet training with or without biofeedback training), approximately 20% of the children is treated successfully. In Chapter 6 the results of a case report are described using suppositories of loperamide in a young adult patient with functional non-retentive fecal soiling. The rationale to use loperamide rectally was the result of the observation during a rectal barostat study, that anal fecal loss occurred due to a rectal contraction, which was unnoticed by the child.

Sometimes children present with chronic abdominal pain in combination with alterations in their defecation pattern, resembling adult patients with irritable bowel syndrome. In adults with irritable bowel syndrome, barostat studies showed that visceral hypersensitivity might be the pathophysiological mechanism causing their symptoms (3). Therefore a barostat study, described in Chapter 7, was conducted to evaluate the possible existence of visceral hypersensitivity in children with chronic abdominal pain. In addition, it would be of great value for the Rome II classification of pediatric abdominal pain, which is based on clinical grounds only, that children with irritable bowel syndrome can be separated from children with functional abdominal pain, by differences in pathophysiological mechanisms, as measured using a barostat.
It is often stated that children just grow out of their functional gastrointestinal disorders and will cure "spontaneously" when puberty is reached. However, these statements have no sound scientific background. Therefore, an adequately designed follow-up study is needed. In Chapter 8 a large cohort of constipated children is described and followed longitudinally for several years into young adulthood.
Reference List


