

Mistakes in paediatric functional constipation diagnosis and treatment and how to avoid them

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Constipation is a bothersome problem for many children. It may present as one or more of the following: infrequent bowel movements with faecal incontinence, hard and often large stools, painful defecation and abdominal pain. No organic cause of the constipation can be found in approximately 95% of children—these children suffer from functional constipation. The prevalence of functional constipation ranges between 0.7% and 29.6% and it occurs in girls more often than in boys (ratio 2.1:1).¹

The diagnosis of functional constipation is based on the paediatric diagnostic Rome criteria for functional gastrointestinal disorders.^{2,3} Additional investigations are indicated only if the diagnosis is not clear or in order to rule out an underlying organic disease, such as Hirschsprung disease.⁴ Education, demystification of constipation, following a reward-based toilet program and keeping a daily bowel diary form part of the nonpharmacological management process.⁴ Disimpaction, maintenance treatment and weaning of medication are all elements of pharmacological treatment.⁴ Polyethylene glycol (PEG) is the first-choice laxative for both disimpaction and maintenance treatment; however, if PEG is not available or is poorly tolerated, lactulose is recommended. Other laxatives are available as a second-line or additional treatment if treatment with PEG is insufficient.

Here we discuss the major mistakes that are made when diagnosing and treating children with functional constipation. The discussion that follows is evidence based in the majority of cases, but where evidence is lacking the discussion is based on the lead author's clinical experience of more than 20 years in the field as a paediatric gastroenterologist.



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Mistake 1 Diagnosing a child with functional constipation on the basis of an abdominal radiograph

A thorough medical history and a complete physical examination are in >95% of cases sufficient to differentiate children with an organic cause of constipation from those with functional constipation. Nonetheless, abdominal radiographs are often used to rate faecal loading.

A systematic review including six studies that evaluated the value of abdominal radiography reported a sensitivity of 60–80% and specificity of 43–99%.⁵ The radiological scoring systems used to rate the degree of faecal loading are based on the amount of stool in the bowel and, to a certain extent, on the importance of bowel dilatation. For the diagnosis of constipation, however, each system uses different objective criteria that

are not clearly defined. Consequently, the rating scales rely on subjective assessments that can vary based on personal experience and interpretation. The ESPGHAN/NASPGHAN and NICE guidelines recommend not using a plain abdominal radiograph for the diagnosis of functional constipation.^{4,6}

Mistake 2 Adopting a 'wait and see' policy to treating childhood constipation

Despite solid evidence that early and prolonged treatment with a laxative is beneficial for the child, and is even positively related to recovery, many health-care professionals follow a 'wait and see' policy in children with functional constipation.⁴ In one study, the clinical course of 47 children who had constipation in the first year of life and were referred to

a tertiary clinic was retrospectively evaluated.⁷ Children who had constipation for <3 months before presentation to the outpatient clinic achieved earlier success than children who had constipation for >3 months before presentation. At the 6-month follow-up, 79% of the children who presented after <3 months were successfully defecating without using laxatives, in contrast to 32% of the children who presented after >3 months ($P<0.002$.)

The negative association between longer duration of symptoms and good clinical outcome might indicate that therapeutic intervention in an early phase of constipation is more likely to be beneficial. Those children treated <2 months before presentation reached first success without using laxatives earlier than children who were treated with oral or rectal laxatives for >2 months (84% versus 36%, $P<0.002$) at 6 months of follow-up. The poor prognostic outcome in children treated with laxatives for >2 months before enrolment is probably related to the longer period of time they had inadequately treated symptoms. As a consequence of repeated painful defecations and accumulation of faeces in the rectum, children may develop stool-withholding behaviour, which exacerbates the problem.⁴

Mistake 3 Treating a child who has functional constipation by using fibres

The prevalence of constipation in children is associated with a diet low in fibre.^{8–10} The ESPGHAN/NASPGHAN and NICE guidelines recommend having a normal fibre intake (i.e. 5 g + the age in years of the child).^{4,6} Two systematic reviews, however, illustrate the limited clinical value of fibre in the management of childhood constipation.^{11,12} In addition, increasing dietary fibre intake accompanied

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by extensive behavioural interventions does not increase bowel frequency or reduce the requirement for laxatives.¹³

Mistake 4 Increasing the fluid intake above normal to treat childhood constipation

Increasing fluid intake has been suggested to soften the stools. One study assessing extra fluid intake in children with functional constipation, however, showed insufficient evidence for its advantageous effect on constipation symptoms.¹⁴ Therefore, it is not recommended that the fluid intake in children with functional constipation exceeds normal levels.^{4,6} An exception should be made for the extra fluid that is required for certain medications to be taken, such as PEG, which needs to be dissolved in water.

Mistake 5 Giving probiotics to treat a child who has constipation

There are some data indicating that constipation is associated with alterations in the gut microbiota in both adults and children.^{15,16} Consequently, modulation of the gut microbiota with probiotics is a potential therapeutic approach for constipation. Indeed, in adults who have constipation, some probiotic strains (such as *Bifidobacterium lactis*) have been shown to have a beneficial effect on stool frequency and consistency and to reduce the gut transit time.¹⁷ Nonetheless, larger studies are required to determine which species/strains, doses and duration of treatment are efficacious in adults with constipation.¹⁷

By contrast, studies to date do not indicate that probiotics are more effective than placebo for the treatment of constipation in children.^{18,19} Thus, there is currently no evidence to support the use of any probiotic strain for the treatment of children with functional constipation.

Mistake 6 Using olive oil to treat childhood constipation

Mineral oil (or liquid paraffin), consisting of hydrocarbons, is not absorbed in the intestine. Consequently, it can be used in the treatment of constipation as a lubricant of faeces. The efficacy of mineral oil in the treatment of childhood constipation has been demonstrated in multiple studies.²⁰ Olive oil, on the other hand, mainly consists of triglycerides,²¹ which are almost completely absorbed in the small intestine. Therefore, except for children with malabsorption, olive oil does not reach the colon to be able to exert a laxative effect.

Furthermore, there is no evidence from clinical trials to support the use of olive oil for the treatment of constipated children.

Mistake 7 Treating a child who has constipation with laxatives for a duration of 2 weeks

After successful disimpaction, maintenance therapy should be initiated to prevent the reaccumulation of faeces.²² Osmotic laxatives are the first step in the pharmacological treatment of functional constipation. They are poorly absorbed by the intestinal wall, which leads to intraluminal accumulation of hyperosmolar particles. This stimulates retention of water in the intestinal lumen, softening the stools and increasing peristalsis through intestinal distension. Furthermore, some osmotic laxatives increase peristalsis through a decrease in intraluminal pH.

PEG (or macrogol) is the first-choice osmotic laxative in children with functional constipation. It is a linear polymer, in which water molecules are retained by means of hydrogen connections, causing an intraluminal fluid volume increase. It is not metabolized and is minimally (<1%) absorbed in the intestine.²³ Lactulose is a synthetic derivative of lactose. This hyperosmolar agent is not hydrolyzed by digestive enzymes in the small intestine and is, for that reason, poorly absorbed by the intestinal mucosa. In the colon, this disaccharide is fermented into hyperosmolar low molecular weight acids by intraluminal bacteria.²⁴ This results in intraluminal water retention and a decrease in intraluminal pH, which induces an increase in colonic peristalsis. The bacterial fermentation of these agents also leads to formation of gas, which induces additional intestinal distension and increases peristalsis.

Maintenance treatment should be gradually weaned rather than abruptly discontinued in order to prevent a relapse.²⁵ If maintenance treatment has stabilised symptoms for a duration of at least 1 month (i.e. the defecation frequency is ≥ 3 times per week) and the child does not fulfil any other Rome IV criteria, weaning can be considered.^{21,22} It is recommended to evaluate symptoms again 2 months after the cessation of treatment, to prevent or detect relapses.

Mistake 8 Using biofeedback training in children who have constipation

Approximately 50% of children with functional constipation contract rather than relax their sphincter muscles during an attempt to defecate. Biofeedback training utilizes reinforcing stimuli in an attempt to achieve a

recognizable sensation and to encourage an appropriate learnt response. In theory, biofeedback training may help children with dyssynergia to adapt their defecation dynamics. Indeed, several studies have shown the efficacy of biofeedback for correcting defecation dynamics, but a well-conducted, large, randomized controlled trial failed to demonstrate a clinical benefit of biofeedback in children with constipation compared with standard management.²⁶ Current evidence, therefore, does not support biofeedback training for the treatment of childhood constipation.²⁶

Mistake 9 Treating childhood constipation with a behavioural intervention

Stool withholding has a major role in the development of constipation in infancy and early childhood. Passing a hard stool leading to pain, strict early toilet training, stubbornness and concentration on other activities that are more exciting than going to the toilet are possible risk factors for stool withholding.

Although the precise pathophysiological mechanisms underlying functional constipation are not always clear, psychosocial factors such as major life events, socioeconomic status, educational level and parental child-rearing attitudes might be important.^{27,28} Furthermore, there is an increased risk of constipation in children with behavioural disorders, such as autism spectrum disorders and attention deficit hyperactivity disorder.^{29,30}

Psychoeducation is crucial for parents to change their behaviour towards the child with constipation and faecal incontinence.³¹ A positive nonaccusatory approach to the child is necessary to carry out therapeutic procedures at home. It is expected from parents to reinforce appropriate toileting behaviour and to ignore the inappropriate behaviour of pant soiling and stool-withholding behaviour. Before applying a behavioural intervention program, it is of major importance to tackle negative perceptions of parents. If parents still assume the faecal incontinence is their child's fault and that he/she is doing it on purpose to tease parents, the treatment becomes very difficult and may be even impossible.

Mistake 10 Using laxatives to treat faecal incontinence in the absence of any other symptom of constipation

Stool-withholding behaviour is an important aetiologic factor in the development of childhood constipation. It can lead to the accumulation of a large faecal mass in the rectum that is difficult to evacuate. In 75% of children with constipation, faecal impaction leads to overflow

faecal incontinence, which is the involuntary loss of soft stools that pass the solid, obstructing, faecal mass. In approximately 10% of the children (mainly boys), faecal incontinence is not accompanied by any other symptom of constipation. These children have nonretentive faecal incontinence according to the Rome IV criteria.³

It has been hypothesized that children with nonretentive faecal incontinence ignore or neglect the urge to defecate. Indeed, a randomized controlled trial showed no beneficial effect of laxatives for the treatment of these children.³² By contrast, however, the number of faecal incontinence episodes increased. The treatment of these children is difficult and often long lasting and should include education about the pathophysiology, treatment and prognosis of functional nonretentive faecal incontinence, a strict toilet training program in combination with a reward system and a daily bowel diary, and/or cognitive behavioural therapy. In a minority of cases rectal irrigation or treatment with loperamide is a useful alternative.³³ Lastly, counselling and treatment of comorbid psychosocial disorders is sometimes needed.

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- 'Colorectal sensory and motor dysfunction in constipation: Lessons for the management of adult and paediatric patients' at UEG Week 2013 [<https://www.ueg.eu/education/session-files/?session=800&conference=48>].

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