

# Constipation in children

Brown RA, MBChB, MPhil, DCH(SA), FRCS(UK), FCS(SA), Paediatric Surgeon

Wood RJ, MBChB, MRCS, DPEC(SA), FCPaedSurg(SA), Paediatric Surgeon

Department of Paediatric Surgery, University of Cape Town, Cape Town

Red Cross War Memorial Children's Hospital, Cape Town; Panorama Mediclinic, Cape Town

Correspondence to: Robin Brown, e-mail: [profrobinbrown@gmail.com](mailto:profrobinbrown@gmail.com)

Keywords: constipation, children, evacuation, faecal mass, regular maintenance therapy

## Abstract

Constipation in children is a universal problem, occurring in 0.7-28% of the population. The exact aetiology is unknown, but the majority of children have a functional, rather than organic, aetiology. Symptoms associated with constipation include abdominal pain, a poor appetite and faecal incontinence, all of which interfere with the quality of life of the child and his or her family. Early intervention with appropriate management is necessary to prevent ongoing sequelae. Once an organic cause has been excluded, a programme of intervention should be implemented, namely evacuation of any faecal mass present, followed by regular maintenance therapy to encourage evacuation of a daily soft stool for at least 2-3 months, prior to gradual withdrawal. Emotional support, exercise and dietary modification are linked to the therapy and will ensure a successful outcome. Failure to implement the protocol may result in ongoing problems in up to 50% of children as they enter adulthood.

© Medpharm

S Afr Fam Pract 2013;55(4):350-353

## Introduction

Constipation in children is a common problem, occurring in up to one third of children at some stage during their development.<sup>1</sup> Up to 25% of children who are referred to a paediatric gastroenterologist have a disorder of defaecation.<sup>2</sup> Constipation can be defined as the infrequent passage of a hard stool, but it is dogged by incomplete definition, and is considered to be a symptom, rather than a disease. A normal stooling pattern is perceived to be a sign of underlying good health. Constipation is associated with abdominal pain, a poor appetite and overflow incontinence, all of which will have an impact on the child's development, as well as on family dynamics. It appears that developing countries are not spared from the condition.<sup>3</sup>

Early diagnosis and appropriate management are necessary to prevent the progression of ongoing symptoms and signs associated with the constipation. Underlying organic causes have to be considered and excluded. A programme of management can then be entered, with additional attention being paid to diet, exercise and emotional support. A bowel-training programme has to be started to encourage a daily soft bowel action, which should be maintained for at least three months prior to gradual withdrawal while normal colonic function is restored. Failure to successfully navigate the initial problems associated with constipation may lead to long-term constipation and its attendant interference with a normal adult lifestyle.

## Normal stooling pattern

As constipation is defined by the number of stools per week, it is important to correlate stool frequency with age. At one week of age, four stools (a range of 1-9) are passed per day, decreasing to three per day at four months of age, two stools per day at four years of age, and three per week at 10-15 years of age.

## Definition of constipation<sup>4</sup>

When defining constipation, there should be no evidence of structural endocrine or metabolic disease.

There should be a history of more than two months (> 4 years old), or one month (< 4 years old), of:

- Less than three stools per week.
- A passage of large hard stools associated with pain.
- More than one episode of faecal incontinence per week, after the acquisition of toilet skills.
- A palpable abdominal or rectal mass.
- Large stools that obstruct the toilet.
- Painful stooling with retention, posturing or withholding behaviour.

## Presentation

Other than the obvious decrease in stool frequency, constipation can present as abdominal pain (80%), soiling (80%), faecal impaction (70%) and stool withholding (over 90%), in children who are younger than three years of age.

It is necessary to enquire about these associated symptoms as they already imply a significant effect, so mandate initiation of a therapeutic programme is needed to correct the progression of the constipation.

## Aetiology

There is a functional, rather than organic, cause, in over 90% of paediatric constipation cases. Diet plays a role, with lack of fibre, roughage and fluid thought to be factors. Lack of exercise and behavioural overlay accentuate it,

**Table I: Organic causes of constipation**

|   |
|---|
| <b>Anatomical malformation</b>                |
| Imperforate anus                              |
| Anal stenosis                                 |
| Anterior displaced anus                       |
| Pelvic mass (sacral teratoma)                 |
| <b>Metabolic or endocrine</b>                 |
| Hypothyroidism                                |
| Hypercalcaemia                                |
| Hypokalaemia                                  |
| Diabetes mellitus                             |
| Multiple endocrine neoplasia type 2B          |
| <b>Gastrointestinal</b>                       |
| Cystic fibrosis                               |
| Coeliac disease or gluten enteropathy         |
| <b>Neuropathic conditions</b>                 |
| Spinal cord abnormalities                     |
| Including tethered cord                       |
| Neurofibromatosis                             |
| <b>Intestinal nerve or muscle disorders</b>   |
| Hirschsprung's disease                        |
| Visceral myopathies                           |
| Visceral neuropathies                         |
| <b>Abnormal abdominal musculature</b>         |
| Prune belly syndrome (Eagle-Barrett syndrome) |
| Down's syndrome                               |
| Gastroschisis                                 |
| <b>Connective tissue disorder</b>             |
| Scleroderma                                   |
| Systemic lupus erythematosus                  |
| <b>Drugs</b>                                  |
| Opiates                                       |
| Phenobarbitone                                |
| Antacids                                      |
| Anticholinergics                              |
| <b>Other</b>                                  |
| Heavy metal poisoning (lead)                  |
| Vitamin D intoxication                        |
| Cow's milk protein intolerance                |

particularly when potty training and new school attendance occur at the same time. The administration of antibiotics, a nappy rash and diarrhoea occur often with illness, and this will initiate or exacerbate the condition. Slow transition has been suggested as a contributory factor in up to two thirds of children.<sup>5</sup> Once established, behavioural accompaniment and interference with family dynamics also perpetuate the problem, and have to be addressed when treating constipation.

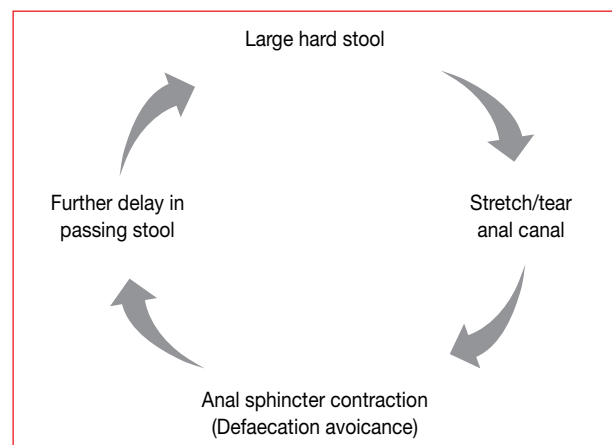
Only 5-10% of childhood constipation has an underlying organic cause (Table I). This relates to the gastrointestinal tract (anorectal abnormalities, and nerve and muscle disorders) and drugs or metabolic causes. Surgeons are duty-bound, using a rectal biopsy, to exclude an underlying organic cause for the constipation which could necessitate a surgical operation for cure (aganglionosis, dysganglionosis and Hirschsprung's disease). "Red flags" should warn of a possible organic cause in a child who presents with constipation (Table II).

**Table II: Surgical versus idiopathic causes of constipation**

|   |
|---|
| <b>Red flags</b>  |
| Delayed passage of meconium > 24 hours  |
| Age of onset < 12 months  |
| Failure to thrive   |
| Distension  |
| No soiling, stool withholding and large calibre stools  |
| Associated with extraintestinal symptoms, cutaneous pigmentary abnormalities, urinary symptoms, enterocolitis and upper gastrointestinal symptoms |

## Pathophysiology of idiopathic constipation

The initiating factor is thought to be a perianal insult, either from a tear of the very sensitive anal canal lining (fissure in ano) caused by the passage of a large hard stool or perianal excoriation associated with ongoing loose stools. This damages the perianal mucosa and skin, causing pain with



**Figure 1: Vicious cycle perpetuating constipation**

internal anal sphincter spasm, which leads to a reluctance to pass stools, stool retention, faecal desiccation and hard stools.<sup>6</sup> When the stool is passed, it again tears the anocutaneous junction, aggravating the condition (Figure 1). The vicious cycle continues unless treated, resulting in progressive and gradual distension of the rectum above the internal sphincter, with associated decreased prograde propulsive activity from the proximal dilated colon.

## Clinical assessment

### History

The history must include:

- A historical review, viz. the passage of the first meconium. (This should be within 24 hours in a term baby).
- The age at onset, and any possible relationship to the cessation of breastfeeding.
- The frequency, consistency and size of the stool.
- Associated pain or bleeding on defaecation.
- Incontinence and withholding behaviour.
- Dietary intake and medication.

### Examination

The examination must include:

- A percentile chart of the child's weight and height.
- A full general examination, excluding hypothyroidism.
- An abdominal examination, especially for distension and a palpable faecal mass.

#### *Perineal inspection*

The perineal inspection must search for:

- A fissure, fistula, excoriation and the presence of the stool on the perianal skin.
- Evidence of incontinence or abuse.

#### *Rectal examination*

The rectal examination must:

- Inspect the tone and size of the anal opening.
- Search for a palpable faecal mass, the consistency of the stool and other rectal masses.
- Exclude a pelvic mass. (Presacral tumours are rare causes of constipation).
- Check for explosive decompression on withdrawal of the finger in a small baby, as this suggests Hirschsprung's disease.
- Inspect the spine and sacrum.

### Investigations

An abdominal X-ray can confirm the diagnosis and assess the extent of the problem, based on stool distribution throughout the colon and associated colonic distension.<sup>7</sup> Others question its use.<sup>8</sup>

Further investigations are only indicated if there are associated red flags (Table II), or in those with intractable symptoms. They may include a rectal biopsy to confirm the ganglion cells; a barium enema to identify strictures, an extraherrial mass or a transition zone; and X-ray transit studies, which may identify local rectosigmoid holdup and manometry to assess the state of the sphincters.

### Treatment

It is important for the doctor to establish a trusting relationship with the patient and parents in order to demystify the condition, explain the cause and proposed plan of action, and organise long-term follow-up. Primarily, treatment should aim at prevention, and secondly, at interrupting the progressive deterioration of stooling ability because of distension of the rectum, with associated internal anal sphincter spasm. The treatment plan has to include counsel and support to both the child and the parents who must be fully involved in the management programme. It is essential that they have an understanding of the pathophysiology of the condition and implications of failure to adhere to the presented treatment.<sup>9</sup>

#### *Behaviour and dietary modification*

Behaviour and dietary modification play the most important role in a successful outcome and will expedite the long-term nature of the intervention. If the child is old enough, he or she can be included in the discussion, with an emphasis on his or her participation in the treatment. The passage of a soft daily stool is the goal. Psychological support may be necessary to reinforce appropriate behaviour patterns and encourage adherence to the protocol. Dietary manipulation will help to promote a successful outcome, with the aim of maintaining a high-fibre diet and a balance of grain, fruit and vegetables. Fluid intake should be encouraged. Little evidence has been found to support the use of fluid supplements, prebiotics, probiotics or behavioural intervention as being effective in treatment.<sup>10</sup>

So what are the cornerstones of treatment?

#### *Disimpaction*

Prior to commencing maintenance therapy, it is essential to evacuate any faecal loading of the rectum. The rectum should be emptied and kept empty, thus removing the faecal "plug", and at the same time allowing the rectum to return to a normal size. This can be achieved medically with large daily doses of a prograde iso-osmotic laxative, e.g. Pegicol® or Go Lightly®, or alternatively, a phosphate-containing enema given rectally or even orally. A manual disimpaction of a large faecal mass under general anaesthetic is less time-consuming and traumatic for the child. It has the advantage of being able to exclude any other underlying local cause

for the constipation at the same time, as well as dilating the internal sphincter and being able to perform a biopsy to exclude underlying pathology, which may be present in up to 40% of patients with retractor constipation.<sup>11</sup>

### Maintenance therapy

In addition to dietary and behavioural modification, once the faecal mass has been evacuated, it is necessary to maintain a regular bowel action, i.e. at least once every two days.

A large number of different therapeutic regimes have been tried because of the high incidence of the condition and the lack of overwhelming success of any specific therapeutic intervention.

The stool has to be kept soft. This can be achieved using lactulose, a synthetic disaccharide, or sorbitol, an osmotic laxative. The dosage is 1-3 ml per kilogramme body mass per day. Unfortunately, the soft stool may not evacuate completely. In this case, a suppository should be added, or even Senekot®, to increase large bowel muscular contractibility. It must be given at night to promote evacuation of the soft stool the following morning.

A non-absorbable solution of polyethylene glycol added to water (Movicol® or Klean-Prep®) is a more physiological way of promoting a daily stool. The advantages are that the dose can be titrated against the effluent. The medicine is not absorbed because of the large (polyethylene glycol) molecule. Therefore, it is necessary to mix it with the correct dosage of water prior to drinking it, otherwise it may result in electrolyte shift, or fail to cause adequate peristalsis.

A daily soft bowel action should be encouraged to occur after a meal when gastrocolic reflux will assist. Once the daily soft bowel action has been established, maintenance therapy has to be continued for months, based on the length of the preceding history. If the constipation has been present for years, it will take months to resolve. Treatment should be gradually withdrawn once a regular stooling pattern has been established over the next few months. Short bursts of medication can be restarted if symptoms recur.

Local anaesthetic jelly, e.g. Remicaine® or Catherjel®, can be applied to the perianal area prior to stooling to help with the pain.

### Other treatment options after medical therapy

A colonic washout is another treatment option after medical therapy, particularly if the constipation relates to a mega rectum with overflow incontinence.

If conventional treatment fails, further options can be considered, including relaxation of the internal sphincter with persistent surgical dilatation, an injection of botulinum toxin or a sphincterotomy, resection of an enlarged localised rectosigmoid distended loop, or an antegrade colonic washout via an appendicostomy (Malone procedure).

### Prognosis

Sixty per cent of children remit within a year, but up to 50% will relapse within five years. Thirty to 50% will have symptoms five years after the initial presentation, and 30% will suffer problems beyond puberty.<sup>12,13</sup>

A poor prognosis is predicted in the event of an onset of less than one year, a history of more than one year and faecal incontinence on presentation.

### References

1. Leoning-Baucke VA. Prevalence rates for constipation and faecal and urinary incontinence. *Arch Dis Child.* 2007;93(6):486-489.
2. Di Lorenzo C. Constipation. In: Hyman PE, editor. *Pediatric gastrointestinal motility disorders.* New York: Academy Professional Information Services; 1994.
3. Rajindrajith S, Devanarayana NM, Mettananda S, et al. Constipation and functional faecal retention in a group of school children in a district in Sri Lanka. *Sri J Child Health.* 2009;38:60-64.
4. Rasquin A, Di Lorenzo C, Forbes D, et al. Childhood functional gastrointestinal diseases. *Gastroenterology.* 2006;130(5):1527-1537.
5. Wheatley JM, Hutson JM, Chow CW, et al. Slow transit constipation in childhood. *J Pediatr Surg.* 1999;34(5):829-832.
6. Borowitz SM, Cox DJ, Tam A, et al. Precipitant of constipation during early childhood. *J Am Board Fam Pract.* 2003;16(3):213-218.
7. Blethyn AJ, Verrier-Jones K, Newcombe R, et al. Radiological assessment of constipation. *Arch Dis Child.* 1995;73(6):532-533.
8. Pensabene L, Buonomo C, Fishman L, et al. Lack of utility of Abdominal X-ray in the evaluation of children with constipation: comparison of different scoring methods. *J Ped Gastroenterol Nutr.* 2010; 51(2):155-159.
9. Rajindrajith S, Devanarayana NM. Constipation in children: novel insight into epidemiology, pathophysiology and management. *J Neurogastroenterol Motil.* 2011;17(1):35-47.
10. Tabbers MM, Boluyt N, Berger MY, et al. Nonpharmacologic treatment for childhood constipation: systematic review. *J Pediatrics.* 2011;128(4):753-761.
11. Simpson RB, Ryan DP, Schnitzer JJ, et al. Surgical evaluation and management of refractory constipation in older children. *J Ped Surg.* 1996;31(8):1040-1042.
12. Van Ginkel R, Rietsma JB, Butler HA, et al. Childhood constipation: longitudinal follow-up beyond puberty. *Gastroenterology.* 2003;125(2):357-363.
13. Sutphen JL, Borowitz SM, Hutchinson RL, Cox DJ. Long term follow up of medically treated childhood constipation. *Clin Paediatr (Phila).* 1995;34(11):576-580.