

Clinical features, psychological issues and management of constipation in childhood

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Summary

This article provides a basic introduction to constipation and stool withholding. Anatomy and physiology, psychology and the various treatment options, including fluid, fibre and laxatives, are covered.

Aims and intended learning outcomes

This article aims to explain some of the physiological and behavioural concepts behind stool withholding, its links with constipation, and appropriate management options. After reading it and completing the time out activities you should be able to:

- Explain the onset and management in a way that is easily understood by children and families.
- Be aware of the different therapeutic approaches and be able to tailor therapy to an individual child.
- Identify obstacles and strategies to overcome them.

Introduction

Constipation is a common problem in childhood, affecting at least one in four children at some stage (van den Berg *et al* 2006) and accounting for about 10 per cent of paediatric referrals. For some it is short lived, while for others it continues and escalates, such that it dominates the child's life and that of his or her family. Unfortunately, the experience of families is that they can sometimes receive inappropriate advice and support from healthcare professionals. Anecdotally, parenting websites show postings that testify to this fact.

Children with constipation have a poorer quality of life than children with inflammatory bowel disease (Youssef *et al* 2005.) This is disappointing as the condition is easy and rewarding to treat. Prompt treatment may prevent the problem becoming chronic (van den Berg *et al* 2005). Recent studies suggest that, if untreated or under-treated, it can persist into adulthood (Bongers *et al* 2010).

Anatomy and physiology

After food is eaten, it is broken down in the small intestine. If the bowel is working normally, by the time

the residue reaches the large intestine it is a semi-liquid, brown substance. In the large intestine, water is reabsorbed so that the longer the stool remains in the large intestine, the dryer and harder it becomes. If it travels through too quickly it will end up as diarrhoea, if too slowly as constipated stool.

The speed of passage through the bowel depends on stool consistency and peristalsis. The former may be altered in disease, for example malabsorption, or in therapy with the use of stool softeners. It is difficult to influence gut transit. Peristalsis is controlled by smooth muscle, which is not under voluntary control. It may be influenced by the autonomic nervous system – which will respond to anxiety. Some biochemical changes, such as hypothyroidism or hypercalcaemia, can also influence gut transit time.

At the anus, the sphincters are made up of voluntary muscle and are therefore under conscious control (Figure 1). This allows social defecation – control until it is acceptable, followed by release (von Gontard and Neveus 2006). In stool withholding the sphincters may be in spasm and it may be hard to allow them to relax.

As a consequence of this 'physiological' obstruction, the rectum may, over time, distend to produce a megarectum (van der Plas 2000). If this occurs the rectum may become less contractile and less sensitive. The clinical observation that most children respond to treatment suggests that this should be fully reversible, and is more likely to be an effect of stool withholding rather than a cause of it (Chiarioni *et al* 2005)

Defining constipation

Constipation is derived from the Latin *constipare* which means to push together. Because it merely describes what the stools look like, this definition does not explain

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the underlying causes of constipation, let alone do justice to its consequences. The definition underplays the impact the condition has, which can lead to substandard treatment of an easily-managed condition. Unfortunately, guidelines from the National Institute for Health and Clinical Excellence (NICE) (2010) seem to fall into this trap as well, focusing more on the quality of stool passed rather than the experience related to passing it. It seems more appropriate to consider the problem from a symptom-based approach by looking at the impact the stool has on a child rather than the impact of the child on the stool.

If a child is happily passing a hard stool every four days with no symptoms at all, it is difficult to know why we should take too much notice. Alternatively, if they are passing a soft stool on most days, but with great distress, then it is a problem worth tackling. Although there might be some pain when passing a constipated stool, the real problems arise as a consequence of that pain. A natural response is to try to avoid pain. If defecation is painful, the way to avoid the pain is by trying to stop the stool coming out. This is called stool withholding and can cause multiple symptoms.

Stool withholding

The more the child holds on, the bigger, harder and more frightening the stool becomes. Finally, when they cannot hold on any more, the stool is voided and scares them even more. This can develop into a vicious cycle.

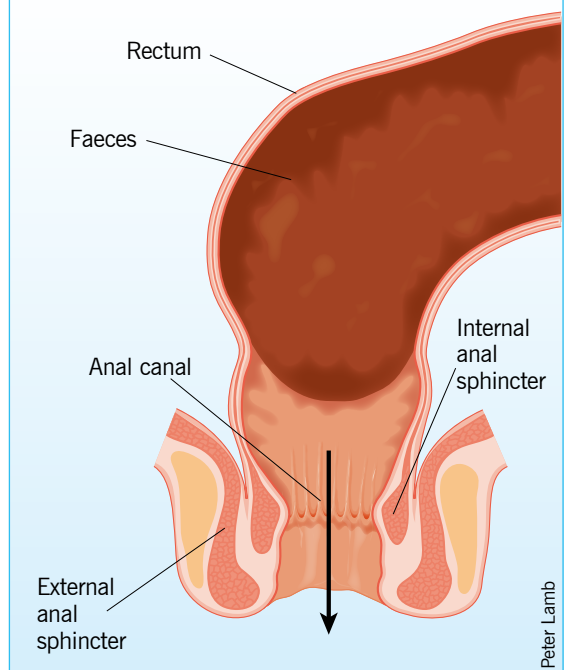
After a while holding on can become a habit so that, as the stool descends in the rectum, the anal sphincters will contract – almost as a reflex – and not allow it to come out even if the child wants it to. The memory of pain can be powerful.

A useful analogy is comparing this to revisiting your old school for a reunion and finding yourself outside the head teacher's office. It is likely that you will have some kind of nervous reaction triggered by your memories. Even if you know there is nothing to worry about, your body will still react strongly in a physical way.

Stool withholding is a battle between the bowels, which are trying to get the stool out, and the anus, which holds it in. The child will desperately wish to be free of the stool – just unhappy that there is no other method of elimination (Cohn 2006).

A perennial question from families, and healthcare professionals, is: 'Is there a problem with the bowels?' It is important to point out that there is no problem with absorption of foods – because malabsorption will lead to diarrhoea. A more complex consideration is overall bowel motility. In most children bowel motility is normal, it is just that they are holding on (von Gontard and Neveus 2006, Bassotti *et al* 1999). It is essential to understand that when dealing with constipation,

Figure 1 The defecation process



which has resulted in stool withholding, the challenge is to change a well-established habit.

Now do time out 1.

When stool withholding presents

Stool withholding can start at any age; even babies of a few weeks can show symptoms which are often misinterpreted as being gastroesophageal reflux. It is likely to be triggered by passing a hard or painful stool. This can happen in the neonatal period because of poor feeding, for instance a delay in establishing breastfeeding or a baby who is being feed-restricted and receiving intravenous fluids. In some babies there is a clear association between stool withholding and introducing cow's-milk based feeds (Iacono *et al* 1998).

Weaning may be a common trigger in infancy, as may an acute illness, or perianal discomfort such as bad nappy rash. As children become older, other factors will come into play – most notably potty or toilet refusal. This can be absolute, when children refuse to defecate in any potty or toilet, or specific,

1 Complex consideration

Time out Imagine that you are stuck on a train with no toilets and you need to open your bowels. What do you do to try not to defecate? How does this affect your concentration and temperament. Imagine the physical symptoms and the fear that your holding in may not be successful? What if this went on for three hours, three days or three weeks?

such that they will only go at home or when a trusted adult is present. There is suggestion that most children who present with toilet-training problems have had issues relating to defecation before starting the training (Blum *et al* 2004).

Later on, a major obstacle is school toilets. These could be the subject of an entire journal, let alone one article. About 60 per cent of young people will not defecate at school (Barnes and Maddocks 2002, McGavin 2003, Cohn 2004). So, it is not surprising that much of stool withholding associated with older children revolves around school toilet issues.

Clinical features

Stool withholding can present in many ways, mimicking other conditions, such as gastroesophageal reflux, an acute abdomen, or epileptic seizures. Making an accurate diagnosis is crucial. It can prevent unnecessary investigations and allow the initiation of effective therapy which may resolve the problem. However, there are good reasons why diagnosis is sometimes delayed.

In young babies, if stool withholding is successful, parents may miss the hints. They will see symptoms in their baby, but may not link them to withholding. As children get older, it would be unusual for parents to follow them into the toilet, and they will presume that everything is 'normal' because they have not been told otherwise. As a paediatrician I have stopped being amazed that when I ask how often a young person goes to the toilet, they reply 'once every week or two,' and the parents are aghast and respond by saying: 'I thought you went every day.'

The clinical features can be easily traced back to the mechanism of holding on. Initially there will be gripping abdominal pain which, as the holding on continues, will become more frequent and intense. After a while this can become almost constant. Children may have severe pain, which causes screaming for many hours of the day. The pain is usually relieved after opening the bowels, but can persist, especially if not all the stool has been passed. Because passing a stool is frightening, even if children know that it will ease the pain, defecation is still too difficult.

As holding on requires more effort, the rest of the body will be recruited. Classically, there will be tensing and crossing of the legs, and adopting a number of positions designed to help keep the stool in. Although parents report that their children are straining, this is usually to stop the stool rather than to pass it. The posturing can involve the whole body and, if it comes in spasms, it can mimic fits (Cohn 2005). Often during a withholding spell, children will seem distracted and distant, which further suggests that they may be having an epileptic seizure, and if the withholding has been incompletely successful, they may soil, which can be

misinterpreted as 'epileptic incontinence' (Case study one). As the posturing becomes more constant this can lead to back or leg pain. Because sitting down is not a good withholding position, children will seem fidgety and unable to sit still.

The effort required to withhold, will increase as withholding increases. With each peristalsis will come the need to hold on. At this time the child will usually need to focus on holding on; this will cause them to focus exclusively on withholding so they may appear to be disobedient or not concentrating. Not surprisingly learning and school work can be badly affected. Added to this, the physical effort of holding on can leave little energy for other activities. Because the pains may keep children up at night they can become tired and lethargic during the day.

A feeling of abdominal fullness, coupled with an awareness of the gastrocolic reflex means that many children's appetites wane the longer they have been withholding their stools. However hard children try to withhold their stools, this cannot continue forever and sometimes the stool will be voided. This can be in the form of overflow, passing small lumps or passing something more substantial. The first two can happen many times a day and can be painful and embarrassing. Anal fissures, caused by passing hard stools and rectal prolapse, caused by excessive propulsion, are common.

The child's behaviour during a withholding cycle can become challenging. Parents often feel powerless – not knowing how best to manage it. In the author's experience the situation can become so bad that it is not unusual for parents to say that they have not booked holidays for years, because they feel imprisoned by the stool withholding symptoms (Case study two).

Cerebral palsy Children with cerebral palsy are a particularly vulnerable group. Poor feeding can lead to a hard stool, which triggers the withholding process.

Case study one

Joseph is a three-year-old boy with a complex neurological disorder, which causes global developmental delay and seizures. He presented almost weekly with prolonged episodes of abnormal movements, which were difficult to treat. The episodes became more frequent despite increasing doses of anti-epileptic medication. During one admission, a history of constipation/stool withholding was ascertained. He was started on appropriate laxative treatment and his symptoms dramatically resolved. His anticonvulsant medication was significantly reduced.

Case study two

Gary is five years old and has had constipation with overflow since he was a few months old. He has been prescribed numerous courses of laxatives, which have provided short-term benefit. Initially, his mother was told that he would grow out of it. Frequent visits to the GP and health visitor did not produce any lasting results, and he was punished when he soiled himself. On receiving appropriate treatment of a combination of fluid, fibre and laxatives to produce a soft, easy, regular stool, Gary was opening his bowels on the toilet every day, with no further soiling.

The posturing associated with it can be misinterpreted as increasing spasticity. The screaming in pain is interpreted as being 'part of him'. In reality once the withholding is addressed the children are often more relaxed – in every sense of the word. Therefore, it is especially necessary to ask about bowel habit in children with disabilities.

Urinary complications Constipation, also contributes to urinary problems. This occurs for a number of reasons. Most simply, a full rectum can push on the bladder and alter bladder function. This is similar to the effects of a uterus pushing on the bladder in pregnancy. Additionally, if a child is trying to hold on to a stool, they will usually have to hold on to their urine as well. It is difficult to urinate and not defecate at the same time, particularly for girls.

This can lead to abnormal emptying, wetting, frequency, bedwetting and increased urine infections. Children with any of these symptoms should be properly assessed because they will not get better if there is underlying untreated constipation/stool withholding. Once the child has emptied themselves, these symptoms dissolve, albeit only for a short time, until the cycle begins again. Constipation and stool withholding is a problem that engulfs not only the child but the entire family (Cohn 2006).

Now do time out 2.

Red flags

Most children over the age of two or three will readily

2 Ineffectual treatment

Time out Refer to case study two. How do you think Gary and his mother may feel about his previous treatment and how would you address these issues and promote positive treatment in the future?

volunteer that they are stool withholding. In a few cases, constipation will be linked to a more serious underlying cause. In most cases, where there is a confirmatory history and normal examination, there is no need for any tests or investigations. The examination should include inspection of the anus and perianal area. Digital rectal examination is rarely indicated, and should only be performed in an appropriate setting by a skilled practitioner (NICE 2010). Similarly x-rays are not necessary if the history is convincing (Case study three). Occasionally an x-ray may be the only way of convincing a sceptical family.

There is little role for measuring rectal pressures, because these rarely, if ever, alter management (NICE 2010). Many units will use transit studies, taking serial x-rays to see how quickly radiopaque markers will travel through the bowel. While these, undoubtedly, provide some information, they do not necessarily alter clinical management.

Coeliac disease There may be some discussion about testing for coeliac disease. Certainly a number of constipated children are found to have coeliac disease on testing, but as it is present in up to 1 per cent of the population it is hard to know if the coeliac disease is causal or coincidental.

There are a number of red flag signs associated with constipation and stool withholding. These are highlighted in Table 1.

Safeguarding Most guidelines on constipation refer to safeguarding issues. While child maltreatment is common, there is no indication that it is more likely to occur in children with constipation than it is in other children (Cohn 2007). Certainly, it is almost unheard of to detect child sexual abuse by routine physical examination. This form of maltreatment is invariably only discovered following a verbal disclosure or allegation, and often by the time it comes to light

Case study three

Jessica is nine years old. She has significant stool withholding and overflow. She soils herself up to eight times a day. You have diagnosed her condition and have identified that she should be disimpacted and should then commence maintenance therapy to increase regularity.

You have explained that it might take some weeks to achieve this. She explains that she could never defecate in school.

Her parents have already taken excessive time off work and risk losing their jobs if they miss more.

there may be no physical signs at all. Over reliance on physical signs, in the absence of any convincing history, is likely to seriously overestimate the likelihood of abuse in children, with devastating consequences. This is what seems to have happened in the Cleveland child abuse case in the 1980s when reflex anal dilatation was mistakenly taken as a sign of sexual abuse (Butler-Sloss 1988, Valman 1988).

Reassurance for parents As most children present with a history that has been present for months or years, the following reassurance triad can be helpful for parents.

- If this were a congenital condition, that is, the way he was put together, this would have been present from birth.
- If he had a twisted bowel, blockage or obstruction, this would present in a completely different way.
- If there was anything seriously wrong with him he would be very sick by now.

Commencing treatment

It is necessary to understand that constipation/stool withholding is an abnormal reflex response. As such, treatment involves changing the reflex or habit, and the aphorism that it is going to take as long to treat as it has been for it to build up is often true. Although

there will be some children who will need treatment for longer. The good news is that as soon as the child is passing a soft, easy and regular stool it will seem as if they are cured. The theory is that by passing stools easily, the fear of defecation will diminish and then, at a much slower pace, the bowel habits will return to normal.

Fluid, fibre, laxatives The three things that can improve bowel function are: fibre, fluid and laxatives. It does not matter how these are used: the right dose is the one that works. The goal of treatment is to make defecation painless. In essence, there should be no difference in behaviour before and after defecation. In most children this is achieved by getting them to open their bowels daily. However, how often you go is less important than how you go. Although the NICE (2010) guidelines advise that dietary interventions are not used alone as first-line treatment, in practice, many children have poor diets and inadequate fluid intake. It would seem sensible to ensure that fluid and fibre intakes are at least adequate; this can be all that is required. To enable this, it is useful to provide information about fibre content in everyday foods (Table 2, page 34).

Anecdotally, there are a number of children whose problems seem to commence soon after cow's milk is introduced to their diet. Some show a dramatic improvement on starting a dairy-free diet, with the likely cause being cow's milk protein intolerance (Iacono *et al* 1998). If indicated and practical, a dairy-free trial can yield significant results (Irastrorza *et al* 2010.)

Children who drink lots of milk also tend to eat less and, therefore, form fewer stools. As a rough guide children above the age of one should drink a maximum of 560ml (one pint) of milk a day. Initially, for a

The Mr Poo story

Do you know where Mr Poo lives? He lives in your tummy and in your bottom.

And where do you think he likes to play?

He likes to play in nappies, potties and especially in toilets.

Now Mr Poo says: 'I want to come out and play.'

What do you say: 'yes Mr Poo', or, 'Not now!'

I think that you say: 'Not now Mr Poo.'

Mr Poo asks again and you say: 'Not now Mr Poo.'

So he asks again and you still say: 'Not now!'

Well, if you really wanted to do something and mummy or daddy said 'no' how would you feel?

Would you get a bit cross? So how do you think

Mr Poo feels if you don't let him out – well he gets a bit cross too.

And if you are cross do you shout and stamp your feet?

Did you know Mr Poo does the same thing.

And how can you tell if Mr Poo is shouting and stamping his feet – he gives you a tummy ache.

Well, did you know that Mr Poo really wants to be your friend and he says that if you let him come out, he will make sure that no poos can hurt your tummy or bottom ever again.

(Adapted from Cohn 2006)

Table 1 Red flags signs associated with constipation and stool withholding

Red flag	Possible causes
Delayed passage of meconium – more than 48 hours after birth	Hirschsprung's disease.
Faltering growth	Cystic fibrosis. Hypothyroidism. Coeliac disease.
Abnormal anus – position/tone/bruising	Neuromuscular problems. Anatomical problems. Crohn's disease – unlikely. Child maltreatment – unlikely.
Fevers	Inflammatory bowel disease. Tumours.
Chest problems	Cystic fibrosis.
Abnormal reflexes/talipes	Neurological problem, for example, spina bifida.

(Adapted from National Institute for Health and Clinical Excellence 2010)

Table 2 American dietary recommendations for fluid intake per day by age

	Total water intake per day, including water contained in food	Water obtained from drinks per day
Infants zero to six months	700ml assumed to be from breast milk	
Seven to 12 months	800ml from milk and complimentary foods and beverages	600ml
One to three years	1,300ml	900ml
Four to eight years	1,700ml	1,200ml
Boys nine to 13 years	2,400ml	1,800ml
Girls nine to 13 years	2,100ml	1,600ml
Boys 14 to 18 years	3,300ml	2,600ml
Girls 14 to 18 years	2,300ml	1,800ml

These recommendations are for adequate intakes and should not be interpreted as a specific requirement. Higher intakes of water are required for those who are physically active or who are exposed to hot environments. Obese children may also require higher total intakes of water.

(Adapted from US Department of Health and Human Services/US Department of Agriculture 2005)

stool-withholding child, defecating will be painful. They should be encouraged and receive positive support. The use of simple stories, such as Mr Poo (Cohn 2006), can be used with children aged up to seven years (see panel, page 33). If they are scared of sitting on a toilet then this should not be attempted until the physical act of defecation has become easier. If they are forced onto a toilet then they are likely to hold on even more. If they are happy to sit on the toilet, they should be encouraged to sit at least once a day, ideally, after every meal. They should sit for a few minutes only – an egg timer is ideal to measure this. They should have their feet supported so may need a footstool or upturned toy box. If the seat is too big then an insert would be useful. It is also helpful to the child and practitioner to blow something – such as a trumpet or windmill, which has the dual purpose of serving as a distraction while helping the child to bear down. The child can relax, their hands are kept busy and it is difficult to get into a withholding position. It also helps them to bear down. If they do this, they should be rewarded for merely sitting, with a bonus for defecation.

Laxatives Many children will need laxative treatment. NICE guidelines (2010) recognise that the dose is often higher than that recommended by the Children's British National Formulary. Occasionally, under expert advice a higher dose may be needed (NICE 2010). The aim is to produce a soft, easy, regular stool, and to continue until the withholding habit is overcome. To achieve this, the plan has to be manageable. There are enough options to find a solution that is practical. This is the only way the family will be able to adhere to the plan. The ideal dosage and timing of medication will need to be

established, and this can take a month or so of trial and error. If starting a dose of laxatives, the effect should not be judged too soon. Normally, allow three to five days before deciding if more, or less, is required.

Judging the correct dose of laxative can be difficult. The child should be producing a decent amount of stools every day. If they are doing little stools once a day then they will need more laxative to defecate all in one go. If they are doing one large stool a day, then they might need a little less. Ideally, the child should be able to defecate at a reasonable time, preferably in the morning, before going to school. Sometimes, changing the timing of the medication can deliver this result. Now do time out 3

Macrogols are now the laxative of first choice. At present Movicol Paediatric is the only one licensed for children under 12. Although most children are unaware of the medication in their drinks, a small but significant number find the taste unpleasant. In this situation other laxatives should be used. For more information on the recommended doses of laxatives see the NICE guidelines (2010). Parents can be anxious about whether laxatives will make their child's bowels lazy,

3 Implementing a care plan

Time out What needs to be considered to increase the chances of success for Jessica with the plan referred to in case study three.

- What are the challenges about instituting such a programme?
- Which professionals should be involved?

and whether they will become dependent on them. The answer to this is that we are trying to change a habit. If we stopped the laxatives before the habit has been changed, the child will slip back to withholding and it will appear that the bowels have become lazy or that the child is dependent. If, however, we see the process through we should, in time, be able to stop the laxatives. Fear of laxatives can lead families to give an inadequate dose. This is unfortunate because if the child is undertreated and the stools are hard, the process of change cannot start to happen. Effectively, if a child is not having enough laxative, it is little better than having no laxative at all.

Suppositories and enemas The problem with stool withholding is that the child is petrified of things going through their bottom. While, suppositories or enemas may produce an immediate result, they usually exacerbate the problem in the long term. They should only be used if a child is in severe distress. In children who are impacted, but not overly uncomfortable an oral disimpaction regimen, using a macrogol or sodium picosulfate is invariably successful – as long as a sufficiently high dose is used. Often this needs to be above the licensed dose, so should only be advised by healthcare professionals with appropriate training.

Psychology

As most children will respond to simple measures, it seems reasonable to only refer to specialist psychological services those children who have other obvious psychological problems or who are not responding to treatment or have residual psychological issues after treatment.

Maintaining and stopping treatment

Treatment is a long-term process and there may be setbacks. These are usually caused for simple reasons, such as running out of medication or spending all day at school, and can be overcome by increasing the dose of laxative until things return to normal. Sometimes the dose will need to remain at a higher level. Ideally, as the withholding diminishes, the dose would become too great, leading to the production of too much stool every day. It could then be weaned easily. In reality, this rarely happens. In this case it is worth trying to reduce the medication – as long as there have been no setbacks – every few months. However, if the child resorts to withholding, the dose will need to be increased to one that is effective. Because stool withholding should be seen as a chronic condition, family support is crucial. Nurse-led clinics can be successful and rewarding for all concerned (Sullivan *et al* 2006).

Conclusion

This article has provided a basic introduction to constipation and stool withholding. There are many areas which are worthy of much greater discussion but space is limited here. These include advances in surgery (Clayden *et al* 2010) and further psychological theories.

4 Practice profile

Time out Now that you have read the article you might like to write a practice profile. Guidelines to help you are on page 36.

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