Management of Childhood Functional Constipation CE

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KEY WORDS
Childhood, evidenced-based, functional constipation, management, pharmacology

OBJECTIVES

1. Explain the criteria for functional constipation diagnosis.
2. Manage children with functional constipation using the most current evidence-based recommendations.
3. Discuss first- and second-line medications for fecal disimpaction and maintenance therapy.

Constipation is a common problem during childhood, and 0.7% to 29.6% of children are constipated worldwide (Mugie, Benninga, & Di Lorenzo, 2011). This condition accounts for 3% to 5% of pediatric primary care visits and up to 25% of gastroenterology consultations (Di Lorenzo, 2000; Youssef & Di Lorenzo, 2001). Children presenting to the emergency department with abdominal pain are most often diagnosed with constipation (Caperell, Pitetti, & Cross, 2013). Constipated children have more outpatient and emergency department visits, and their overall annual medical cost is approximately twice as much as that of children without constipation (Choung et al., 2011). Nearly all childhood constipation is functional, but 5% to 10% is due to an organic cause (Youssef & Di Lorenzo, 2001). In contrast to organic causes, functional constipation is not a result of a structural or biochemical abnormality (Lewis, Palsson, Whitehead, & van Tilburg, 2016).

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Conflicts of interest: None to report.

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A joint evidenced-based guideline for the evaluation and treatment of functional constipation was published in 2014 by the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition and the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition (Tabbers et al., 2014). The guideline recommends the use of the ROME III definitions to diagnose functional constipation when there is no organic pathology (see Box 1). These definitions have evolved over the past 30 years and are used as criteria to identify functional gastrointestinal disorders (Drossmanm, 2016). To fulfill the ROME III definitions, infants and children up to 4 years of age must have two or more of the criteria for at least 1 month. Children with a developmental age of at least 4 years must have a minimum of two criteria at least weekly for a minimum of 2 months, without criteria supporting irritable bowel syndrome (Tabbers et al., 2014). Since the 2014 guideline publication, ROME IV definitions have been introduced. They are similar to the ROME III definitions except that a 1-month duration of symptoms is needed to define constipation in children of all ages (Benninga et al., 2016; Hyams et al., 2016).

Fecal impaction is defined as a hard mass palpated in the lower abdomen, an enlarged rectum filled with a large amount of stool on rectal examination, or the abdominal radiography finding of excessive stool in the distal colon (Tabbers et al., 2014). An impaction is present in 30% to 75% of constipated children and more than 90% of children with fecal incontinence (Benninga, Voskuijl, & Taminiau, 2004; Loening-Baucke, 2002).

Infant dyschezia is a condition categorized by the ROME IV criteria that occurs in infants younger than 9 months of age and typically resolves spontaneously in 3 to 4 weeks. The infant strains and screams for at least 10 minutes before successfully or unsuccessfully passing soft stool (Benninga et al., 2016). Bowel movements usually happen daily. It is believed this behavior occurs because of the inability to coordinate increased intra-abdominal pressure with relaxation of the pelvic floor muscle. As muscle coordination improves during infancy, this condition resolves (Tabbers

BOX 1. ROME III: Diagnostic criteria for functional constipation

Child with developmental age < 4 years:
- ≤ 2 defecations/week
- At least one incontinence per week after the acquisition of toileting skills
- History of excessive stool retention
- History of painful or hard bowel movements
- Presence of a large fecal mass in the rectum
- History of large-diameter stools that may obstruct the toilet

Additional symptoms may include irritability, decreased appetite, and/or early satiety, which may resolve immediately after defecation of a large stool.

Child with developmental age ≥ 4 years:
- ≤ 2 defecations in the toilet per week
- At least one episode of fecal incontinence per week
- History of retentive posturing or excessive volitional stool retention
- History of painful or hard bowel movements
- Presence of a large fecal mass in the rectum
- History of large-diameter stools that may obstruct the toilet

Source: Tabbers et al. (2014).

et al., 2014; Youssef & Di Lorenzo, 2001). Evidence supports that infant dyschezia does not lead to infant functional constipation, and there is no role for treatment other than providing reassurance to parents (Kramer et al., 2015).

FUNCTIONAL CAUSES OF CONSTIPATION

Bowel movement frequency and consistency is a function of diet composition and gastrointestinal motility. The stool pattern of exclusively breastfed infants can vary from multiple times a day to soft, infrequent bowel movements. Infants fed standard infant formula produce fewer daily stools than breastfed infants, although by 4 months of age they have similar bowel movement frequency. Breastfed infants produce larger stools than those fed standard infant formula until food introduction. This is because breast milk contains nonnutritive proteins and oligosaccharides that are not digested or absorbed (Weaver, Ewing, & Taylor, 1988). Standard infant formulas contain higher levels of lipids and minerals, particularly calcium fat acid soaps, which contribute to stool hardness (Nowacki et al., 2014; Quinlan, Lockton, Irwin, & Lucas, 1995). When standard infant formula is introduced to breastfed infants, fewer and firmer stools are produced (Lloyd et al., 1999). Soy formula–fed infants have harder stools because soy formula contains a small amount of fiber, whereas other formulas do not (Hyams et al., 1995).

Bowel movement frequency decreases with age. Stool production occurs more often in the first month of life and may be attributed to immaturity of the gastrointestinal tract. Research supports a decrease in mean bowel movement frequency between 1 and 4 years of age. After 4 years of age, bowel movement frequency remains unchanged (Baker et al., 2006). There is a positive correlation between infrequency of bowel movements and hardness of stool. This is due to increasing whole gut transit time with age (Weaver & Steiner, 1984).

DEVELOPMENT OF CONSTIPATION

The passage of hard stool can be perceived as painful and is the most frequently reported event resulting in constipation (Borowitz, Cox, Sutphen, & Kovatchev, 2002). Pain leads to stool withholding because the child becomes afraid to defecate. In turn, the withholding creates a cycle of more pain when defecating. Withholding behavior during infancy includes arching the back and stiffening the legs, whereas older children tightly cross their legs or exhibit other unusual postures (Loening-Baucke, 2005). Parents may misinterpret withholding as straining or an attempt to defecate.

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The withholding behavior causes contraction of the external anal sphincter and gluteal and pelvic floor muscles. The fecal mass then moves out of the rectal ampulla and back into the rectosigmoid colon, where the stool becomes harder and larger. Bowel movement frequency is decreased because the rectum accommodates the stool, and the urge to defecate goes away. Fecal incontinence, or leakage of liquid feces around the retained fecal mass, may happen and can be perceived by parents as diarrhea. In children older than developmental age 4 years, fecal incontinence is referred to as encopresis (Benninga et al., 2004).

Toilet training is the second most often reported event leading to functional constipation (Borowitz et al., 2002). It can be a challenge for some parents to toilet train their children. Research supports that stool toileting refusal occurs in 1 of every 5 children. This leads to stool withholding behavior and incontinence. Many parents of these children do not see this as a problem. Their immediate goal is for their child to wear underwear and not have stool incontinence rather than use the toilet to defecate (Taubman, 1997). Children who are constipated before starting toilet training are also more difficult to train (Schonwald, Sherritt, Stadtler, & Bridgemohan, 2004). Most children without developmental delay who do not toilet train by age four years are stool toileting refusers (Taubman, 1997).

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