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Constipation in children: the Sri Lankan perspective

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Functional constipation (FC) is a common problem in the world. The estimated global prevalence is 9.5% [1]. The disorder leads to significant healthcare expenditure. Furthermore, FC significantly affects the health-related quality of life of children and their academic performances [2, 3]. These facts indicate that FC is a global health problem with a significant impact.

Diagnosis of FC in children has been a dilemma for a long time. The first concrete scientific-based diagnostic criteria for FC was released in 1999 as Rome II criteria [4]. The definition evolved over the last two decades, and currently, Rome IV criteria are being used in both scientific research and clinical settings to identify children with FC. These criteria include two or fewer stools in the toilet per week, fecal withholding, history of painful or hard bowel movements, fecal incontinence, large diameter stools and rectal fecal mass found on physical examination. The Rome IV committee of experts recommends that at least 2 of the above criteria should be present at least one month for the diagnosis [5].

Constipation was thought to be a disease of the Western world for many decades. However, one of the first few epidemiological research in Sri Lanka noted a prevalence of 15.4%, indicating the gross underestimation of the prevalence of FC in developing countries [6]. Thereafter several research conducted in Sri Lanka had indicated high prevalence in districts such as Galle, Ampara, and Badulla [6-8]. In addition, the first epidemiological survey from Nigeria found a prevalence of 27%, confirming a high disease burden in the developing world, indicating that childhood constipation is not a disease of the western hemisphere but a global health problem across all socio-economic strata [9]. In addition, other epidemiological studies from Asia also illustrated the higher prevalence of FC in Hong Kong, Taiwan, Indonesia, and India, possibly indicating the shifting of the global epidemiological epicenter from the West to the East [10-13].

Several risk factors are known to associate with FC in children. Poor toilet training is the commonest cause for FC in young children. A study from Sri Lanka first reported the association between psychological stress and FC. It was reported that several psychological stressors such as separation from the best friend, failing an exam, alcoholism of the father, and frequent



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punishments at home increase the tendency to develop FC [14]. In addition, exposure to all three forms of child maltreatment, namely physical, emotional, and sexual abuse, is also associated with FC [15]. In Sri Lanka, Children exposed to three decades of civil war in the border villages also showed higher predilection to develop FC [8]. Several studies have shown the association between consumption of diet low in fiber and development of FC in children [16-18]. Furthermore, an elegant study from Hong Kong showed the association between FC and consumption of junk food [10]. Constipation is also associated with a lack of physical activities and a sedentary lifestyle [19, 20]. All these factors are important in the Sri Lankan context as the country is going through a significant socio-economic upheaval changing the lifestyle of children predisposing them to develop FC in years to come. With the above convincing evidence, we believe that FC in children will be one of the major conditions to inpatient care and outpatient visits to a pediatric hospital in years to come.

The consequences of FC are more than that most clinicians imagine. A study from the Gampaha district of Sri Lanka clearly illustrated the effects of constipation on children's health-related quality of life. In that study, we found that all health-related quality of life dimensions, namely physical, emotional, school, and social functioning, are low in children with FC [21]. Later, a systematic review and a meta-analysis confirmed these findings [2]. The same study also found that in addition to their bowel symptoms, children with FC suffer from a plethora of somatic symptoms, which negatively affect their quality of life and increase their suffering [21]. In an elegant study, Ranasinghe and co-workers found that children with FC suffer from psychological maladjustment and abnormal personality traits [7]. Finally, we also reported that children with FC have a range of emotional and behavioral problems such as withdrawal, social and attention problems, and internalization [22]. All these data indicate the potential psychological damage associated with untreated FC in children. Untreated FC also leads to dilatation of the rectum and hypotonia of the rectal wall and alteration of the motility of the colon, which in the long term may lead to significant bowel damage [23, 24]. Therefore, we firmly believe FC needs to be treated urgently and aggressively to prevent these negative consequences.

FC is a clinical diagnosis using Rome IV criteria. However, it is noted that many clinicians in Sri Lanka tend to perform plain abdominal X-rays to detect fecal matter in the colon. It had been shown that abdominal X-ray has a poor inter and intraobserver reliability in diagnosing FC in children [25]. Similarly, another knee jerk reaction of performing thyroid function tests in children with

constipation is also not very valuable as most children with hypothyroidism have regular bowel motions [26]. Investigations are indicated in children who do not respond to standard treatment for an adequate time with good compliance. These children who have medically refractory constipation need careful evaluation of their colonic and anorectal functions using colonic and anorectal manometry and transit studies. Other blood tests such as screening for cow's milk allergy or celiac disease and checking for electrolyte abnormalities such as hypokalemia and hypercalcemia are not helpful in the day-to-day management of FC in children. Lower gastrointestinal endoscopy is not recommended in children with constipation.

The current management of FC in children needs further refinement. The management can be divided into two arms, namely pharmacological (oral and rectal laxatives) and non-pharmacological interventions (behavioral and dietary adjustment, biofeedback). Most of the time, children may need both approaches to be commenced together from the beginning to achieve the goal of having regular bowel motions. Still, compliance with the treatment plays a crucial role in achieving this goal.

It is vital to clear the impacted stools in the colon and the rectum prior to starting on regular laxatives. Evidence shows that both high dose polyethylene glycol (PEG) (1.5g/kg) and enemas are equally effective for fecal disimpaction [27]. However, because PEG can be administered orally, the National Institute for Clinical Excellence (NICE) guideline recommends using PEG as the first-line treatment for disimpaction in children [28]. Failing to achieve disimpaction in two weeks requires the clinician to combine a stimulant laxative (sodium picosulfate, bisacodyl, docusate sodium, or senna) with PEG. Rectal preparations are prescribed only in cases where oral medications have failed in evacuating the bowel as it can be distressing for children. Further, manual evacuation of the bowel is only recommended for children who do not respond to PEG and enemas [28].

Once complete evacuation is achieved, maintenance therapy should be introduced to avoid re-impaction and facilitate passage of stools. Osmotic laxatives (PEG, lactulose) are commonly used in children as maintenance therapy. Out of them, evidence shows that PEG is more effective compared with lactulose, milk of magnesia, and mineral oil [27]. However, the addition of a stimulant laxative (bisacodyl/ sodium picosulfate) or another osmotic laxative like lactulose is recommended in children who do not respond to PEG [28]. Once the treatment starts, it is vital to continue laxative treatment for a few months to promote regular bowel movement. Further, a trial of

weaning laxatives may introduce slowly over a period of time in response to the nature of stools without abrupt cessation.

The majority (80-100%) of young children with FC demonstrate features of stool withholding [29]. Most of the stool with holders (>80%) refuse to pass stools in the toilet (stool toileting refusal) [30]. Therefore, parents should encourage their child to sit on the potty for at least five minutes after main three meals without distractions. During the process, the child should maintain a proper seating position with legs and feet relaxed. In addition, advice on relaxing the perineum and how to contract abdominal muscles during defecation to achieve proper straining can be delivered through video guides. As this will be time-consuming, parents can use the rewarding system to make their child engage with therapy, which ultimately results in excellent compliance.

Other than addressing the psychological issues that lead to stool withholding behavior, novel therapeutic interventions, such as positive psychology (resilience, self-regulation, optimism) are useful to achieve psychological well-being. Further, it has been shown that these treatment modalities, when starting early in the disease process, might prevent the patient from developing maladaptive coping habits, engage in high physical and psychological symptom reporting, and exhibit poor, costly disease outcomes [31].

Dietary recommendations, including adequate fluid and fiber intake, are considered one of the fundamental interventions in treating constipation by many clinicians. Although consumption of a low-fiber diet is considered one of the causative factors for childhood constipation, the evidence does not support the benefit of using additional fiber for the treatment of constipation. It is essential to have a balanced diet with adequate fiber content as it helps in bulking stools, trapping bile salts, and acts as a prebiotic to the gut flora [32]. The combined guideline issued by the European and North American Societies of Pediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN/NASPGHAN) recommends the average dietary fiber intake for children with FC [27]. Increased fluid /water consumption does not positively affect relieving symptoms of constipation [27]. Other dietary modifications like a trial of cow's milk protein-free diet are recommended only in treatment resistant constipation with expert advice.

According to the existing evidence, biofeedback, pelvic floor physiotherapy, pre and probiotics, alternative medicinal methods (including acupuncture, homeopathy, mind-body therapy, musculoskeletal manipulations such as osteopathic and chiropractic, and Yoga) are not useful as therapeutic interventions.

Several novel pharmacological agents are still under investigation, including serotonin agonists (tegaserod), prosecretory agents (linaclotide, lubiprostone), bile acid absorption inhibitors, and ghrelin receptor agonists. We believe these agents invariably improve the therapeutic armory of constipation in years to come. Similarly, other novel interventions such as botulinum toxin injection and various forms of neuromodulation need further clinical trials before widespread use in clinical settings. Children who continue to have constipation despite optimal medical and non-medical therapy may need surgical interventions, including an antegrade continent enema, stoma formation, and surgical resection.

In a nutshell, constipation in children is a common problem in Sri Lanka, with a prevalence rate equal to the western societies. The risk factors that predispose children to develop FC are equally common in our country. Therefore, a high degree of vigilance is imperative to diagnose FC in children using the current iteration of the Rome criteria. FC is a clinical diagnosis, and most of the commonly used investigations do not serve any clinical purpose in day-to-day management. PEG-based therapy in evacuating fecal-loaded rectum and long-term maintenance is the mainstay of therapy for childhood FC. Other osmotic and stimulant laxatives are used as an adjunct therapy for PEG. Toilet training is an essential part of the management as most young children do have fecal withholding. Other non-pharmacological therapeutic interventions are not helpful in day-to-day clinical practice. Early aggressive therapy is essential to prevent long-term psychological consequences and bowel damage.

Conflicts of interest

All three authors declare no conflict of interest.

Contributor's statement

WH and SR developed the concept and equally contributed to the first draft. NMD edited the manuscript with significant intellectual input. All three authors agree with the final content of the article and take intellectual responsibility of the content.

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