Delayed or not delayed? That is the question in Indian children with constipation

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Childhood constipation is a global public health problem [1]. A recent meta-analysis of the epidemiological data shows that 9% of children across the world is suffering from constipation [2]. It has deleterious effects on health-related quality of life of affected children reducing their physical, emotional, social, and school functions [3]. Families with a constipated child were reported to be socially isolated and frustrated [4]. Furthermore, the cost of care for constipation has risen by 121% in the USA indicating a significant burden on the healthcare system [5].

Prevalence of childhood constipation is dramatically increasing in many countries across Asia. In pre-school children in Hong Kong, functional constipation (FC) was reported to be 29.3%, whereas, in school children in Taiwan, the prevalence rate was as high as 32%, which was the highest prevalence rate in the world [6, 7]. Many other countries such as Sri Lanka (15.4%), Saudi Arabia (22.5%), and China (12.2%) also reported high prevalence rates of FC [8–10]. These figures indicate that Asia is a hot bed for childhood constipation compared to the western countries.

In this backdrop, this issue of the journal timely publishes an article by Shava and colleagues reporting on colonic transit times (CTT) and stool characteristics of children with FC and healthy controls in India [11]. Not surprisingly, stool frequency and consistency significantly differ between Indian children with FC compared to their healthy normative sample. In line with these findings, a significantly prolonged CTT

was found in the group of children with FC as compared to healthy controls. The vast majority (92%) of the constipated children, however, had a CTT less than the 95th percentile of normal healthy children. Lastly, the authors reported that the stool frequency of healthy Indian children was higher compared to those living in the Western countries.

The etiology of FC remains elusive and thought to be multifactorial. Psychological stressors altering the gut-brain axis [12], poor toilet training leading to stool withholding [13], dyssynergic defecation [14], poor dietary habits [15], and slow colonic motility have been suggested as potential mechanisms for childhood constipation. Three types of colonic motility patterns can be identified in children with constipation using either radiopaque markers or radio-nuclear transit studies; these include normal transit constipation, slow transit constipation (STC), and outlet obstruction. Out of these, functional outlet obstruction is by far the commonest (70%). STC is seen only in about 20% of children with FC. They are usually older children, especially girls with intractable symptoms [16].

There are three methods to assess CTT in children. These include the use of radiopaque markers, radio-nuclear transit studies, and the wireless motility capsule. Several methods have been used in both children and adults when it comes to using radiopaque markers to assess CTT, including the single capsule technique and the multiple capsules techniques. Patients are requested to swallow a number of radiopaque markers and depending on the method used, undergo one or a number of abdominal radiographs to locate the positions of the markers [17].

Several studies have been performed in the Western countries to measure CTT in children with FC. Although there are differences in the methods used, almost all studies reported significantly longer CTT in constipated children than the transit found in the current study. In children with slow transit constipation, the reported CTT is even over 100 h, whereas others reported a mean CTT in children with FC at least twice longer than the current study [18–22].

Several reasons are likely to explain the significant difference in CTT between Indian and Western children with constipation.

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Current standard protocols to measure CTT do not recommend to clean the colon or empty the rectum before performing a transit study [18, 23, 24]. To date, almost all studies that assessed CTT in pediatric patients with FC did not clean the bowel before performing the transit study. In contrast, in the current study, newly diagnosed children with FC were given polyethylene glycol (PEG) 1 week before the transit study, or PEG was stopped during the transit study, which likely has shortened the CTT in these children. Secondly, the method used to measure CTT was different from all former protocols used in earlier studies in children with FC, which makes it difficult to compare CTT in different patient samples. However, the authors have used a protocol validated in Indian adults who have different stool frequency than that of the Western population [25]; this protocol, however, has not yet been validated in the Indian children. These factors clearly need to be addressed in future studies measuring CTT in children with FC.

In accordance with the defecation pattern in constipated children in the Western world, the current study shows that the majority of Indian children included in this study fulfilled the Rome IV criteria for FC. More than 90% of the patients had infrequent large painful bowel movements accompanied by fecal incontinence, probably caused by stool withholding behavior [26–29]. Therefore, it is difficult to understand that this clinical picture does not align with the relatively short CTT in the current study. In a previous study, using a prospective diary to report clinical symptoms, a significant correlation was reported between low stool frequency, fecal incontinence, and the presence of a fecal mass in the rectum with prolonged CTT (median CTT was 58 h) [27]. Again, cleaning the colon before assessing CTT might be the reason for the discrepancy in CTT between this study and earlier studies.

The authors also report that the defecation frequency in healthy Indian children is more frequent as compared to children living in Western countries. However, before drawing firm conclusions, some issues have to be addressed. The total number of healthy children included in this study was only 39. In addition, the age difference in their sample was too diverse and lastly children were living in an urban area of Lucknow. Several factors related to normal defecation are however unclear from this study. It is well known that younger children defecate more frequently than the older children. Information in this study is lacking with respect to the age distribution of this sample. Moreover, an analysis of the diet has not been performed, which makes it difficult to conclude that the fiber intake between Indian children and Western children is different contributing to the variation in defecation frequency. Lastly, children living in the region of Lucknow may not be representative for whole India and the developing world.

As authors have observed, larger population-based studies performed in rural and urban areas, in developed and developing countries, evaluating defecation patterns in different populations (healthy and children with FC) and in different

age groups, in combination with a careful analysis of the diet, and using the same methods to evaluate colonic transit are needed to address these important questions raised by this study. Based on the findings of this study, it is however too early to change the Rome criteria for constipated children living in developing countries.

Compliance with ethical standards

Conflict of interest SR, NMD, and MAB declare that they have no conflict of interest.

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