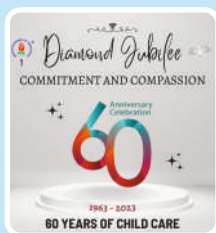


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Newer Research and recommendations In Child Health

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Stooling patterns in young children: What is normal?

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BASED ON ARTICLE

Baaleman DF, Wegh CAM, de Leeuw TJM, van Etten-Jamaludin FS, Vaughan EE, Schoterman MHC, Belzer C, Smidt H, Tabbers MM, Benninga MA, Koppen IJN. What are Normal Defecation Patterns in Healthy Children up to Four Years of Age? A Systematic Review and Meta-Analysis. *J Pediatr.* 2023 Oct;261:113559.

SUMMARY

Defecation disorders in children are becoming increasingly more common and account for a large proportion of a physician's practice. Functional constipation alone accounts 10% of all pediatric gastroenterology referrals. To understand what is abnormal, one should be aware of the normative data. To bridge the wide gap in this knowledge, Baaleman et al conducted a systematic review and meta-analysis of normal stooling pattern in young children less than 4 years of age. Out of 224 eligible studies from Cochrane Library, EMBASE, and MEDLINE, they reviewed 75 cross-sectional, observational, and interventional studies published in English. These studies included 16393 children and 40033 measurements of defecation frequency and/or stool consistency. Based on visual inspection of defecation frequency data, a differentiation was made between two age categories: young infants (0-14 weeks old) and young children (15 weeks-4 years old). Young infants had a mean defecation frequency of 21.8 per week (95 % CI, 3.9-35.2) compared with 10.9 (CI, 5.7-16.7) in young children (P < .001). In young infants, the median defecation frequency ranged from a minimum mean of 7.0 to a maximum mean of 44.9 stools per week with two outliers: 4.9 and 62.6 stools per week. In young children, the mean defecation frequency ranged from a minimum mean of 6.2 to a maximum mean of 17.5 per week, with no outliers. Among young infants, human milk-fed (HMF) infants had the highest mean defecation frequency per week (23.2 [CI, 8.8-38.1]), followed by formula-fed (FF) infants (13.7 [CI 5.4-23.9]), and mixed-fed (MF) infants (20.7 [CI, 7.0-30.2]). Hard stools were infrequently reported in young infants (1.5%) compared with young children (10.5%), and a reduction in the frequency of soft/watery stools was observed with higher age (27.0% in young infants compared with 6.2% in young children). HMF young infants had softer stools compared with FF young infants. Based on visual inspection, categorical stool consistency data of young infants and young children showed an increase in hard stools with increasing age. No difference was found according to gender. Defecation frequencies of both young infants and young children were found to vary slightly between regions and countries without any statistically significant differences (all P values >0.05). In India, the defecation frequency was 26.5 and 11.1 per week in young infants and young children. There was poor information regarding normal stool consistency from our country. Authors concluded that young infants (0-14 weeks old) have softer and more frequent stools compared with young children (15 weeks-4 years old) [1]

COMMENTARY

The authors' conclusions are already well known in our day to day practice and parenting. What is commendable however is the effort made to amalgamate all the information available in literature. As simple as it may seem to the readers, conducting a research for normative data is very challenging. Conducting a meta-analysis on normative data is even more difficult due to heterogeneity in reporting. Despite all efforts, it was inconclusive in this study to assess the normal stool consistency as this is a subjective tool with different perceptions.

How does this study help? There is a thin line that differentiates normal from abnormal. In day to day practice, we often struggle to eliminate the over-reporting of stool patterns in anxious mothers. We require confidence in our counseling and reassurance. Rome criteria for functional diarrhea or constipation defines what is abnormal. But do we know where to draw the line? A lot of factors determine stooling patterns.

Geographical location is a major factor. Healthy Indian adults have a shorter oro-cecal transit time than Westerners possibly due to the high fiber content in our diet. Shava et al in 2018 (not a part of this meta-analysis) assessed stool frequency and colonic transit time in Indian children with functional constipation and healthy controls [2]. They found that stool frequency per week and consistency were significantly different between healthy (9 [2.5-17] years) vs. functional constipation group (4.5 [2-14] years), 7 (7-14) vs. 1 (1-2), and Bristol type 4 (3-5) vs. type 2 (1-3). Total colonic transit time of groups A and B was 16.2 (0.6-36) vs. 22.8 (1.8-35.4) hours; $p = 0.003$. They concluded that Indian children have significantly higher stool frequency and shorter colonic transit time, which are different compared to the reported figures from the West. Most of the Indian children with functional constipation had normal colonic transit time [2].

The second factor that is important for stooling pattern is the infant feeding practices. Some formulations tighten the stools, others tend to soften and increase the frequency. HMF children had a higher and more variable defecation frequency compared with FF children whereas stool consistency was similar in the different feeding groups. This difference in defecation frequency may be explained by differences in feeding pattern (on-demand vs scheduled feeding), milk (microbiota) composition and its effect on gastric emptying. Indeed, shifts in feeding from HMF to FF are known to influence defecation characteristics. Over the years, infant formulas have undergone changes in order to better resemble human milk. These changes range from macronutrient composition changes to the addition of specific additives such as prebiotics and human milk oligosaccharides.

The third and possibly the most important factor is the acquisition of toilet training skills. To coincide with the neurodevelopmental outcome, it is generally recommended that toilet training should not be started before 24 months of age. However there is no defined cut-off age. Practices may vary across various ethnicities. Most children acquire toilet training skills by 3-4 years [3].

The final appeal to physicians is to rationalise their practices on probiotics and antibiotics. To “normalise” the gut microbiota, one should understand the normal gut functions. It may be fool-hardy to chase a normally increased transit time with unnecessary prescriptions. Probiotics may change gut-flora and predispose to allergies and autoimmune diseases. They have no role in constipation. Antibiotics weaken gut immunity and predispose to antibiotic associated diarrhea and dysmotility. Persistent mothers in urban areas may desire “one-two soft stools per day” in their children. Their demand is understandable but is our over-prescription rationale? Is it time to understand the normal stooling pattern.

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