

Original Research Article

Functional constipation in Bangladeshi children: experience of demography and probable risk factors from a tertiary care hospital

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ABSTRACT

Background: Constipation is a common problem throughout childhood. It is important to be fully aware of the factors involved in developing constipation in children. There are few published articles on childhood constipation in Bangladesh. In this study, our aim was to evaluate demography and probable/potential risk factors for functional constipation in Bangladeshi children.

Methods: The study was carried out among 179 children from May 2018 to June 2019 in the department of Pediatric Gastroenterology and Nutrition, Bangabandhu Sheikh Mujib Medical University (BSMMU) both indoor and outdoor basis. Children with constipation who fulfilled the ROME III criteria were evaluated for demography and probable/potential risk factors of constipation.

Results: A total of 179 subjects were included in the final analysis. Among them, 54.75% were boys and 45.25% were girls. Constipation was found more in the age group above 5 years (56.42%), then in 2 to 5 years age group (33.52%) and lower in below 2 years of age (10.6%). Constipation was more among children living in urban area (55.3%) than in rural area (44.69%). Constipation was the presenting complaint in 76.54% subjects, other complaints were abdominal pain (47.49%), anorexia (24.02%), vomiting (19.56%). Diet low in fiber (72.63%) was found as the most common potential risk factor, other factors were ingestion of cow's milk (32.96%), not having regular meals with parents (19.55%), consumption of junk foods (28.49%). Staying with grandparents (16.76%), living in hostel or madrasa / residential religious institute (5.03%), long period of academic activity, [homework (10.61%) / tutor and coaching (7.26%)], unhygienic toilet in school (6.14%) were also found to be probable associated factors in this study.

Conclusions: Functional constipation was found more in boy's and above five year age group. Low dietary fiber, consumption of cow's milk and junk food, unwillingness to use toilets in school, long time in academic activity, were found to be potential underlying risk factors of constipation.

Keywords: Constipation, Children, Epidemiology, Probable risk factors

INTRODUCTION

Constipation is one of the commonest problems in children. It has been problematic from ancient times to present and it is seen world-wide in all races and culture.¹ Constipation is a symptom, not a disease.

Some patients regard constipation as straining (52%), while for others, it means hard, pellet-like stool (44%) or an inability to defecate when desired (34%), or infrequent defecation (33%).² Functional constipation describes persistently difficult, infrequent, or seemingly incomplete defecation without evidence of a primary cause

(anatomic, metabolic, or neurologic etc), this definition is operationalized by the ROME III diagnostic criteria, which requires at least two of six symptoms describing stool frequency, hardness, large size, fecal incontinence, or volitional stool retention for at least two month.³ Constipation adversely affects the daily life of both children and parents. Moreover, it is an important problem which leads to a high number of medical visits and also generates healthcare costs as a result of several procedures involved in diagnosing it and the associated medical problems.^{4,5} The early and accurate assessment and prompt treatment of constipation is vital to the child's wellbeing and lifestyle. Delay in management will exacerbate the problem and perpetuate the child's lack of self-esteem. It is therefore important to be fully aware of the factors involved in developing constipation in children. There are few published articles highlighting childhood constipation in Bangladesh. In this study, our aim was to evaluate demographic characters and potential underlying risk factors for functional constipation in Bangladeshi children.

METHODS

These reports are results from a descriptive and cross-sectional study. The study was carried out among 179 children from May 2018 to June 2019 in the department of Pediatric Gastroenterology and Nutrition of Bangabandhu Sheikh Mujib Medical University (BSMMU) both in indoor and outdoor basis. A structured questionnaire designed by the authors was used to collect information about demographic characteristics, probable underlying risk factors of constipation. The questionnaire was completed at the hospital by concerned physicians. The questionnaire contained information about the child's age, gender, living area and constipation parameters, socio-demographic data of the family, physical or psychological disorders, personal (school phobia/temper tantrum) and family stressors (parental disharmony, sibling rivalry, death of family members) and the food habits of the child etc. Initially, 215 patients were enrolled in the study. Thirty-six were excluded due to incomplete data. Finally, 179 patients were analyzed in this study. ROME III criteria established in 2006 was used to determine whether a child could be considered for functional constipation.^{6,7} Categorical data were expressed as absolute counts and percentages.

Inclusion criteria

All the children aged 12 months to 16 years attending indoor and outdoor of Pediatric Gastroenterology and Nutrition department of BSMMU (a tertiary care hospital) who fulfilled the Rome III criteria for functional constipation were included in the study.

Exclusion criteria

- Children already on the treatment of constipation.
- Children with an organic cause of constipation.

- Parents unwilling to attend the study.

RESULTS

A total of 179 subjects were included in the final analysis. Among them, 54.75% (n = 98) were boys and 45.25% (n = 81) were girls (Table 1). Constipation was found to be higher in above 5 years age group 56.42% (n=101), and lower in below 2 years of age group 10.6% (n=18). Among them 55.31% (n=99) were living in urban whereas 44.69% (n=80) in rural area (Table 1).

Table 1: Demographic characteristics of study subjects (n=179).

Characteristics	Number (%)	
Gender	Male	98 (54.75)
	Female	81 (45.25)
Age groups (years)	<2	18 (10.06)
	2-5	60 (33.52)
	>5	101 (56.42)
Living area	Urban	99 (55.31)
	Rural	80 (44.69)

Constipation was the presenting complaint in 76.54% (n=137) subjects, other complaints were abdominal pain 47.49% (n=85), anorexia 24.02% (n=43), vomiting 19.56% (n=35) (Table 2).

Table 2: Complaints of study subjects (n=179).

Complaints	Number (%) of studied subjects
Constipation	137 (76.54)
Abdominal pain	85 (47.49)
Anorexia	43 (24.02)
Vomiting	35 (19.56)

Table 3 reports potential underlying risk factor in the subjects with functional constipation. Dietary habit found to be one of the major probable risk factor among the subjects. Low fiber diet was found in 72.63% (n=130) children with constipation, among other probable causes, ingestion of cow's milk 32.96% (n=59), not having regular meals with parents 19.55% (n=35), consumption of junk foods was found in 28.49% (n=51) cases. Psychological factors plays an important role too. Staying with grandparents 16.76% (n=30), psychological stress 2.79% (n=5), living in hostel or madrasa/religious residential institute 5.03% (n=9) found to be potential associated factors in this study (Table 3). Less physical activity found in 7.23% (n=13) and child obesity in 2.23% (n=7) subjects. Among academic factors, long period of homework was found in 10.61% (n=19), busy with tutor and coaching in 7.26% (n=13), unhygienic toilet of school in 6.14% (n=11) cases of children with constipation (table 3). We found constipation 6.7% (n=12) in low income group, and 3.35% (n=6) where mother is service holder (Table 3).

Table 3: Probable associated factors related to constipation in study subjects (n=179).

Probable risk factors		Number (%) of studied subjects
Dietary factors	Diet low in fibers	130 (72.63)
	Cow's milk intake	59 (32.96)
	Not having regular meals with parents	35 (19.55)
	Consumption of junk food	51 (28.49)
Psychological factors	Psychological stress	5 (2.79)
	Stays with grandparents	30 (16.76)
	Lives in hostel or madrasa	9 (5.03)
	Maid/servant care giver	3 (1.68)
Less physical activity (no exercise/sports)		13 (7.26)
Obese child		7 (2.23)
Academic activity related	Long periods for homework	19 (10.61)
	Busy with tutors/coaching class	13 (7.26)
	Unhygienic toilet in school	11 (6.14)
Social condition	Low income family	12 (6.70)
	Working / service holder mother	6 (3.53)

DISCUSSION

In this study, 179 children were evaluated with constipation, we found slight male preponderance (54.75%). IP et al and Kajiwarra et al found an increased prevalence in girls.^{8,9} Gannikou R et al found a slight male preponderance in prevalence of constipation (6.4% in boys and 5.7% in girls), Khanna et al also showed a male preponderance in functional constipation, which is similar to our study.^{10,11} Constipation was found more common in above five years age group (56.42%), Kondapalli CS et al found constipation more (57%) in 2-4 years group this difference may be due to changing pattern of toilet training, attention difference of caregivers and difference in regional food habit.²

Constipation seems to be a more prevalent problem in families with a lower education and low-income communities like slum and rural areas.^{12,13} The difference may result from diet habits (high rice/carbohydrate), environmental, cultural and racial reasons and may also be caused by different study methods. Our study result shows 55.31% children with constipation were living in urban where as 44.69% in rural area. In the study conducted by Kondapalli CS et al 30.6% of children with constipation presented with recurrent abdominal pain, in our study we found 47.49% presented with recurrent abdominal pain which is closer to that study.² Cause of abdominal pain may be fecal and gaseous loading of gut. Constipation may present with anorexia, vomiting. We found anorexia in 24%, vomiting in 19.6% as the presenting complaint.

Diet, especially dietary fiber, has often been considered as an important determinant of constipation.¹⁴ Dietary fiber is known to have an extra beneficial effect on constipation due to its fecal bolus-mass incrementing

effect, water retention properties, increasing colon bacteria and gas production, with an acceleration of colon transit.⁵ In this study, it was found, constipated children had a lower consumption rate of vegetables and fruits 72.63% and a higher consumption of junk foods (fried and baked items) 28.49% which contains low fiber, results are similar to the previous studies.¹⁵⁻¹⁷

Andiran et al. suggested that increased consumption of cow's milk was found to be a risk factor for childhood constipation.¹⁸ According to these authors, constipation may be secondary results of cow's milk intolerance or cow's milk protein allergy. However, cow's milk might cause constipation by other mechanisms like allergic colitis with inflammatory infiltrates in the lamina-propria or calcium fatty acid soap formation in sticky feces.⁹ We also found that the consumption of cow's milk was in 32.96% constipated children, which is nearly similar to the previous studies (30%).¹⁸

Some studies have shown that increased levels of psychological stress are associated with constipation.¹⁹ It was also suggested that family events may be a causative factor for constipation in children. A study showed 88% of children with constipation followed a stressful event in their families (birth, death, parents' separation and, immigration).¹⁹

In this study authors found among the studied children with constipation, 16.76% (n=30) was staying with grandparents and 5.03% (n=9) living in hostel or madrasa/religious residential school and 2.7% had other psychological stressors like personal (school phobia/temper tantrum) and familial (parental disharmony, sibling rivalry, death of family members). In the present study, we found that 39.66% of children refused to defecate at school. This may be a cause as well as a consequence of constipation. Cause of refusal may

be the issue of the poor toilet environment and this impacting more on the constipated child. According to a study performed by Lundblad et al, many children influenced by negative perceptions of school toilets have adopted unhealthy toilet habits during school time.²⁰ Their negative perceptions of school toilets develop on the physical appearance of the toilets and on feelings of insecurity when visiting the toilet. For most of the children, a toilet visits away from home can create a psychological strain.

Vernon et al also reported that the avoidance of school toilets has negative consequences for children, such as a higher risk of developing constipation, incontinence and/or urinary tract infection.²¹ Our findings are parallel to these ideas. In the current study, we also found parents anxiety/complaints about academic factors like a long time for homework (10.6%), for tutors/coaching (7.26%) that poses a negative impact on regular bowel movement or associated with the voluntary holding of defecation urge which is associated with fecal impaction and constipation.

In a study performed by Schryver et al, regular sports/physical activity was found to be a protective factor against constipation in adults.²² This is based on the knowledge that slow gastrointestinal transit time is associated with constipation and it is assumed that exercise shortens transit time through the gastrointestinal tract.²² On the other hand, other authors have put forward no relation between physical exercise and constipation in adults.⁴

Unfortunately, there is limited data in the scientific literature about the effects of physical activity on constipation in children. It was assessed that one of the major contributing factors to childhood constipation with disabilities is physical immobility.²³ According to our data, constipation was found in 7.23% children who had less physical activity in and 2.23% children who were obese.

Limitations of the study was that, this was a single-center study with a small sample size. Information's from caregivers other than parents may not reflect the correct picture.

CONCLUSION

Functional constipation was found higher in male, above five year aged children. Low dietary fiber, consumption of cow's milk and junk food, unwillingness to use toilets in school, busy academic schedule were found to be probably related to functional constipation. Families, children and teachers should be educated about constipation and preventive methods for this common problem. Family physicians, pediatricians, should be aware of potential risk factors of constipation as mentioned above. Children with chronic treatment-resistant constipation may have organic causes.

Recommendations

A multicenter study with a large sample size is recommended for assessing risk factors for childhood functional constipation.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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