Frequencies of Different Risk Factors for Functional Constipation in Pediatric Population: Experience from Tertiary Care Center of Bangladesh

Reza R[1], Poly FH[2], Akram L[3], Haque MM[4], Mariom ML[5], Mazumder MW[6]

Abstract

Background: *Functional constipation is a common pediatric dilemma. It causes psychological stress, behavioural abnormality and growth impairment. In our country constipation in children is frequently overlooked and desired evaluation is often ignored. Factual knowledge viewing risk factors of constipation will lead to proper evaluation and early diagnosis which will ensure timely management of constipation.*

Methods: *This was cross-sectional study, carried out in Paediatric Gastroenterology & Nutrition Department, BSMMU from January to December 2022. Total 75 children aged 2-16 years were enrolled here. Samples were collected purposively from outpatient department with consent of parents. Diagnosis of functional constipation was made by Rome IV criteria. Children who fulfilled ROME IV criteria were evaluated for risk factors of constipation.*

Result: *We included 75 children in our study where 56% were male and 44% were female. Constipation was more prevalent in 6 to 10 years (42.7 %). Most common risk factors were unhygienic (69.3%), inadequate toilets (61.7 %) in academic area and during school hours child's embarrassment (65.1%) to use toilet. We observed long duration academic activity (48 %), reading in madrasa (46.6 %), screen time more than two hours (60 %), preference of indoor games (56 %) and child maltreatment (physical abuse 10.6 %; emotional abuse 25.3 %; familial disharmony 18.6 %) as potential risk factors. Inadequate fibre (53.3%) & fluid intake (50.6%), regular junk food consumption (48%) and cow's milk ingestion (34.7 %) were diet related influence of FC.*

Conclusion: *Infrequent number and unclean toilet in academic premises, child's embarrassment to use toilet during school hours, long duration educational activity, use of screen time daily two hours or more, preference of indoor games & lack of physical activity, child maltreatment and familial disharmony were found as frequent risk factors. Regular cow's milk ingestion, junk food consumption, inadequate Fiber and fluid intake and regular were frequent dietary risk factors.*

Key words: *Functional constipation (FC), Risk factors, Children.*

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Introduction:

Constipation is a common disorder of pediatric population. Its prevalence continues to remain high, affecting 1% to 30% of children worldwide.[1,2] It accounts 3% of all primary pediatric care visits and 10–25% of pediatric gastroenterologist visit.[3]

Functional constipation is defined as persistently difficult and infrequent defecation without evidence of a primary cause (neurologic, anatomic, metabolic). According to Rome IV criteria to diagnose FC, for children e"4 years at least two of following ROME IV criteria must be present with duration of minimum one

1. Dr. Renesa Reza, Consultant (Pediatrics) National center for control of Rheumatic fever and heart disease, Sher e Bangla Nagar, Dhaka. Phone no: 01713000884; E-mail: rezarenesa78@gmail.com
2. Dr. Ferdousi Hossain Poly, Shaheed Suhrawardy Medical College and Hospital, Dhaka.
3. Dr. Lubana Akram, Pediatric Gastroenterologist, MO, Dhaka Dental College Hospital, Dhaka.
4. Dr. Mohammad Mominul Haque, Consultant, Department of Anesthesia, Analgesia & Intensive Care Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka.
5. Dr. Most Lubna Mariom, Consultant, Department of Anesthesia, Analgesia & Intensive Care Medicine Bangabandhu Sheikh Mujib Medical University, Dhaka.
6. Dr. Md. Wahiduzzaman Mazumder, Associate Professor, Department of Pediatric Gastroenterology and Nutrition, Bangabandhu Sheikh Mujib Medical University, Dhaka,

Correspondence : Dr. Renesa Reza, Consultant (Pediatrics) National center for control of Rheumatic fever and heart disease, Sher e Bangla Nagar, Dhaka. Phone no: 01713000884; E-mail: rezarenesa78@gmail.com

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month: 1) Two or fewer defecations in the toilet per week. 2) History of painful bowel movement 3) History of retentive posturing or excessive straining 4) One episode of fecal incontinence at least per week 5) History of large diameter stool that obstruct toilet 6) Presence of large fecal mass in rectum. And these symptoms cannot be fully explained by another medical condition and symptoms are insufficient to fulfill the diagnostic criteria of irritable bowel syndrome.[4]

Recent systematic reviews and meta-analyses revealed global prevalence of childhood constipation around 9.5% (0.5–32%).[5] General perception is constipation is limited in South Asian nations such as Bangladesh, India as their diets are high in fiber. But FC in our children is not less and its prevalence in Bangladeshi children is about 11%.[6] And it is more frequent above 5 years age group.[7]

Constipation has remarkable physical and mental impact on a child.[8] It may even cause decelerated physical growth (underweight, short stature).[9] Due to lack of knowledge and understanding of impact, most parents do not pay much attention to identify its risk factors. Limited research works have done to find out prevalence, risk factors and effect of functional constipation in our children. As functional constipation has significant influence on physical growth and quality of life, this study was undertaken to ascertain frequencies of different risk factors for functional constipation in Bangladeshi children.

Methodology:

It was a cross-sectional study, conducted at the department of Pediatric Gastroenterology and Nutrition, Bangabandhu Sheikh Mujib Medical University (BSMMU) from January 2022 to December 2022 (12 months). A total of 75 children aged 2 to 16 years, having functional constipation were enrolled in this study. Children were recruited from outdoor visit. Proper history, clinical examination, relevant investigation, Rome IV criteria were done and samples were selected purposeively. Children having constipation but did not fulfill Rome IV criteria, having organic or chronic disease and already on treatment for constipation were excluded from study. Details clinical history, examination findings and investigation reports were recorded in a predesigned structured data sheet.

Results:

A total of 75 subjects were included in final analysis. Among them 56% (n = 42) were male and 44% (n = 33) were female. Constipation was found to be higher in 6-10 years age group (42.7%).

Table I

Demographic variables of study participants (n= 75)

Age group (years)	Children with FC, n=75, n (%)
1-5	16 (21.3)
6-10	32 (42.7)
11-15	26 (34.7)
>15	1 (1.3)
Male	42 (56)
Female	33 (44)

Table II noted long duration academic activity of 6 hours or more, reading in madrasa, unhygienic and inadequate number of toilets in school premises, feel embarrassed to use toilet during school hours as probable association of functional constipation.

Table II

School related factors in children with functional constipation

Risk Factors	Children with FC, n=75 n (%)
Long time academic activity (≥6 hours)	36 (48)
School (Bengali & English)	33(44)
Madrasa	35(46.6)
No School	7 (9.3)
Adequate Number of toilets	26 (38.2)
Inadequate Number of toilets	42 (61.7)
Hygienic toilet	16 (23.5)
Unhygienic toilet	52 (69.3)
Embarrass to use toilet at school	49(65.1)

Table III analyzed children with functional constipation had **screen time** more than two hours (60%) and had habit of playing indoor games (56%).

Table-III

Analysis of Screen time and Physical activity in children with functional constipation

Risk Factors	Children with FC n=75 n (%)
Screen time <2 hours	30 (40)
Screen time> 2 hours	45 (60)
Physical activity-Outdoor games	33(44.0)
Physical activity-Indoor games	42 (56.0)

Table IV revealed Child maltreatment (physical & emotional abuse) and familial disharmony were higher among children with functional constipation.

Table-IV

Analysis of Psychological factors in children with functional constipation

Risk Factors	Children with FC n=75 n (%)
Child maltreatment	
Physical abuse	8 (10.6)
Emotional abuse	19 (25.3)
Familial disharmony	4 (18.6)

Children with functional constipation had history of less fiber and inadequate fluid intake. They had habit of dietary intake of cow's milk and regular junk food consumption (table V).

Table V

Analysis of Dietary factors in children with functional constipation

Risk Factors	Children with FC n=75 n (%)
cow's milk intake	26 (34.7)
Inadequate fiber consumption	40(53.3)
Inadequate fluid intake	38 (50.6)
Junk food consumption	
Occasional	17 (22.6)
Regular	36(48)

History of constipation in parents (46.6%) & siblings (42.6%), low maternal education (45.3%) and lower economic background (57.3%) were associated risk factors in children with functional constipation (table VI).

Table-VI

Family related risk factors of children with functional constipation

Risk Factors	Children with FC n=75 n (%)
History of constipation among parents	35 (46.6)
History of constipation among siblings	32 (42.6%)
Mother's education (Primary school)	34 (45.3)
Mother's education (Secondary school)	17 (22.6)
Mother's education (Higher secondary)	13 (17.3)
Mother's education (Graduation/above)	11 (14.7)

Discussion

75 children with functional constipation who fulfilled Rome IV criteria were evaluated in this study. We observed FC was more prevalent in the age group 6 to 10 years with slight male preponderance (54.75%). Mazumder et al.[7] showed functional constipation was common above 5 years (56.42%) along a bit male dominance (54.75%). Khanna et al.[10] also observed male prevalence with functional constipation. These findings are similar to our one. On the contrary, in Saudi children, females were affected more than males and male to female ratio was 1:3.5.[11] In India, Kondapalli et al. found female predominance in FC.[12]

In our study we observed, children with long duration academic activity (58.6%), unhygienic toilet at academic environment (61.7%), child's embarrassment to use toilet at school (69.1%) and students of madrasa (56%) had higher percentage of constipation. Hasosah et al. noted

lack of cleanliness of school toilets and homework of >3 hours/day as risk factors of functional constipation.[11] Mazumder et al. showed that 39.66% of children refused to defecate at school.[7] Lundblad et al revealed children often affected by negative impression of school toilets and frequently avoid using of toilets during school hours.[13]

In present study most of our children with FC had history of doing indoor games (65.3%) instead of outdoor playing & physical activity. Schryver et al found regular physical activity as a protective element against constipation in adults.[14] Slow gastrointestinal transit time is associated with constipation and it is assumed that exercise influence rapid gastrointestinal transit and thus improve constipation. Masaaki Y et al. reported lack of physical inactivity significantly associated with childhood constipation.[15] Mazumder et al. found constipation in 7.23% children who had history of less physical activity and 2.23% children who were obese.[16]

Children who preferred to use electronic media more than 2 hours/day had higher percentage of constipation (60%) and it is a potential risk factor in modern Bangladesh. Olaru et al. established lack of exercise and television watching more than 3 hours/day as a possible factor of childhood constipation.[17] Children frequently withhold defecation urge during watching television and playing mobile games which initiate vicious cycle of constipation.

Several research suggested positive link up between psychological stress and childhood constipation.[15] Deva Narayana et al reported school and family related stressful evens such as punishment at school or punishment from parents, bullying and domestic violence were associated with higher constipation rates in Sri Lankan children.[18] Frequent irritability, unwillingness to attend school and lack of communication with parents were established as risk factors of constipation by Masaaki Y, Michikazu S and Takashi.[15] In current study we found higher frequency of physical abuse (10.6%), emotional abuse (25.3%) and familial disharmony (18.6%) among children with constipation. Thus, constipation was significantly higher in children exposed to stressful life events. Modulation of gut motility through brain-gut axis probably alters colonic transit and ano-rectal functions causing constipation.[18]

Here we evaluated dietary habits of constipated children. Increased consumption of cow's milk may consider as a risk factor.[19] In our study, children with functional constipation had history of regular cow's milk intake (34.7%). Andiran et al stated constipation may occur due to cow's milk intolerance or cow's milk protein allergy.[19] Young children with chronic constipation and anal fissure consume larger amounts of cow's milk than children with a normal bowel habit.[19] Mazumder et al. also described consumption of cow's milk as one of the risk factors of functional constipation.[16] They found 32.96% constipated children had history of cow's milk intake which is nearly similar to our study.[16]

Our children with functional constipation had history of less fiber (68%) and inadequate fluid intake (58.6%) and habit of regular junk food consumption (50.6%). Wu et al. (2010) found association of constipation with lower intake of vegetables, fruits, soybean products and eggs.[20] Kondapalli et al. monitored vegetables & fruits intake were inadequate in 73.2% children of constipation and 32.7% of them took junk foods in form of fried itemss.[12] Olaru et al. analyzed main food groups of children and revealed constipated children consumed meat products, concentrated sweets and soft beverages more often and they had habit of less fruit and vegetables intake.[17] Findings of these previous studies have much similarity with our one.

We observed children with functional constipation had history of constipation in parents (46.6%) and siblings (42.6%). Similar life style and food habit may explain this familial aggregation. Some researchers suggested presence of genetic and familial connection with constipation.[1,16] Rajindrajith S. et al. reported higher prevalence of constipation (49%) within close family members.[21] Benzamin et al suggested functional constipation of Bangladeshi children had positive familial history.[6]

We marked lower maternal education as one of the risk factors for constipation. In our study, 53.3% mother completed only primary education. Kilincaslan et al. (2014) observed maternal education (elementary) and employment as one of the determinant factors of constipation.[22] J.F. Ludvigsson also figured out relation between low maternal education and constipation.[23] Mazumder et al. stated lower maternal education as a more prevalent problem in Bangladeshi children with FC.[16]

The study was conducted in a single center and it was a cross-sectional study. Further study with large sample and control group would increase reliability of the findings.

Conclusion

Infrequent number and unclean toilet in academic premises, child's embarrassment to use toilet during school hours, long duration educational activity, use of screen time daily two hours or more, preference of indoor games & lack of physical activity, child maltreatment and familial disharmony were found as frequent risk factors. Regular cow's milk ingestion, junk food consumption, inadequate Fiber and fluid intake and regular were frequent dietary risk factors.

Limitation: Single centre study with small sample size which does not represent all children of our country.

Conflict of Interest: The authors have no conflict of interest.

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