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Study on Normal Bowel Pattern of Children and Prevalence of Functional Constipation

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Abstract: ***Background**: Functional constipation is a common pediatric disorder with substantial impact on quality of life, yet regional data from Southern India are scarce. **Objective**: To assess normal bowel patterns in children and evaluate dietary, psychosocial, and clinical correlates of functional constipation. **Methods**: A prospective descriptive study was conducted at A.C. S. Medical college and Hospital (June 2024– July 2025). Children aged 2–12 years meeting Rome III criteria for functional constipation were compared with age-matched controls with normal bowel patterns. Data on demographics, diet, psychosocial factors, stool frequency, and consistency were collected using structured questionnaires and dietary charts. Statistical analysis employed SPSS 15.0 with $p<0.05$ considered significant. **Results**: The prevalence of functional constipation was 13.5%, most frequent among children aged 2–4 years, with a female predominance and higher rates in lower socioeconomic groups. Early toilet training, breakfast skipping, low intake of fruits and vegetables, marital disharmony, sibling rivalry, and school phobia were significantly associated. Children with normal bowel habits averaged 1.14 soft stools/day. **Conclusion**: Pediatric functional constipation in this population is influenced by both dietary insufficiencies and psychosocial stressors. Public health measures promoting balanced diet, regular breakfast intake, appropriate toilet training, and supportive home/school environments may help reduce its burden.*

Keywords: Functional constipation, Pediatric constipation, Normal bowel pattern, Rome III criteria, Toilet training

1. Introduction

Constipation is a common problem in children.10 % of children present with constipation; and 10 % to 25 % of referrals to pediatric gastroenterologist are for constipation.

Definition

Table 1: Defecation Frequency in Children

Age	Average Number of Stools per day
< 1 Month	3- 4
1 Month to 1 year	1.5- 2
1- 2 years	1- 2
2- 18 years	1

Constipation is a symptom, not a disease. Different patients have different perceptions of symptoms. Some patients regard constipation as straining (52%), while for others, it means hard, pellet-like stools (44%) or an inability to defecate when desired (34%), or infrequent defecation (33%).

The definition of functional constipation as per the **Rome III**

Diagnostic Criteria for FGIDs (Functional gastrointestinal disorders)
Must include one month of at least two of the following in infants up to 4 years of age:

1) Two or fewer defecations per week
2) At least one episode/week of incontinence after the acquisition of toileting skills
3) History of excessive stool retention
4) History of painful or hard bowel movements
5) Presence of a large fecal mass in the rectum
6) History of large diameter stools which may obstruct the toilet

2. Review of Literature

Vikrant Khanna et al; from the department of pediatric gastroenterology Sanjay Gandhi postgraduate institute of medical science Lucknow India did a study to analyze the etiology, clinical spectrum and outcome of constipation in children. In their study 85% of children had functional constipation while the remaining 15% had an organic disorder. The organic group had delayed passage of meconium and abdominal distension as compared to functional group. Fecal impaction (69%), straining (35%), withholding behavior (27.4%), and fecal incontinence (30.8%) were common in functional group37.

Wald E.R, et al; did a study on the normal bowel pattern of children. They did an analysis on the bowel habits and toilet training in a diverse population of children. They gathered data concerning bowel habits and toilet training of developmentally normal children ages 5 to 8 years. In their study population toilet training started at a mean of 27.2 months and was completed at a mean of 32.5 month. Girls trained 3 months earlier than boys in an average. 95% of children defecated daily or every other day. Straining at defecation and infrequent stooling were reported significantly more often for girls, while staining of underclothes and passage of large bowel movements were reported more often in boys. About 10% of children fulfilled criteria for functional constipation.

Weaver L.T and Steiner H from University Department of Child health, Royal Victoria Infirmary, Newcastle upon Tyne, performed a study on the bowel habits of young children. 350 children from a single general practice were studied. According to their study they found that all children ate a predominantly low fiber, mixed diet. 85% had bowel movements once or twice a day. 96% had bowel movement every day to every other day. At all ages stools were sausage type predominantly and only < 10% produced grape sized stools. Consistency of stools was soft most of the time. Those

children who opened their bowels less than once a day produced significantly harder stools 0.9% of children had passed blood in their stools. 19% of these opened their bowels less than once a day compared with only 4 % of those children who had never passed blood.

KS IP et al; department of pediatrics and adolescent medicine, Pamela Youde Nethersole Eastern hospital, Chai Wan, Hong Kong conducted a study on community based study of the prevalence of constipation in young children and the role of dietary fiber. The result obtained in their study was that 29.6% of children were constipated. The incidence of family history of constipation was significantly higher in the constipated group (14%) than in non constipated group. Mean dietary fiber consumption was 4.1 g/day corresponding to 45.5% of the daily recommendation. Constipated children had a significantly lower dietary fibre intake of the daily recommendation than the non-constipated group.

Giuseppe Iacono, et al; a study on the effect of cow's milk allergy in constipation. They performed a double-blind study, crossover study comparing cow's milk with soy milk in 65 children with chronic constipation. In their study they found that 45 of the 65 children (68%) had a response while receiving soy milk. None of the cow's milk had a response. Children with a response had a higher frequency of coexistent rhinitis, dermatitis, or bronchospasm than those with no response. Anal fissure and erythema was also more common in this group. Signs of hypersensitivity, such as specific IgE antibodies to cow's milk antigens was more in this group. The authors conclude that in young children, chronic constipation can be a manifestation of intolerance of cow's milk.

Lundblad B and Hellstorm AL in his study on 386 Swedish school children aged 6 to 16 years using a semi structured questionnaire in 2001,questioned regarding the availability of toilet paper, soap, cleanliness, andfoul smell. The author concludes that many children influenced by negative perceptions of school toilets have adopted unhealthy toilet habits during school time. For many children, toilet visit away from home can create a psychological strain. Thus, children often find it easier to endure physical discomfort of not relieving themselves rather than the psychological and social discomfort of using a school toilet. This could have an adverse effect on bladder and bowel function of children.

Maartje M. Van den Berg, et al; from the department of pediatric gastroenterology and nutrition Amsterdam, Netherlands did a systematic review of the published literature to assess the prevalence, incidence, natural history, and co morbid conditions of functional constipation in children. The prevalence of childhood constipation in the general population ranged from 0.7% to 29%. Variance of gender specific prevalence was reported in seven studies and five of seven studies reported no significant difference between boys and girls. The age group in which constipation is most common could not be assessed with certainty. Socio economic conditions were not found to be associated with constipation.

Stephen M. Borowitz, et al. from the department of pediatrics and behavioral medicine, University Virginia health sciences center studied the precipitants of constipation during early childhood from 125 families visiting their primary care physician for the first time with a child aged between 2 and 7 years with the complaint of constipation. In the study the authors found that constipated children in comparison to control children did not have a parent or sibling with a history of constipation. They did not begin toilet training earlier than did control children. Parents reported more difficulties with toilet training in constipated children. Parents of constipated children indicated their children had more difficult and more painful defecation experiences than did parents of control children. In conclusion the authors say painful defecation is the primary precipitant of constipation during early childhood. Parents should be counseled to be attentive to such experiences and taught to intervene quickly to lessen the risk that their child will develop persistent constipation or fecal soiling.

George Peppas in his study "A systematic review of Epidemiology of constipation in Europe and Oceania" reviewed 21 studies and found a mean value of reported constipation rates as 17.1%.Female gender, age and socioeconomic and educational class seem to have major effect on constipation prevalence. In one of the study the prevalence of constipation was 6.3% for the 1st class to a considerably higher 10.2% for the 5th class. In another study low maternal education level is considered as a factor significantly associated with increased odds for constipation in children.

Aim of the Study

1) To study the normal bowel pattern of children with respect to their food habits and collect data regarding psychosocial aspect of toileting issues.
2) To study the diet pattern, psychosocial aspect and clinical profile of children with habit constipation.

3. Materials and Methods

Study place:
A.C.S Medical college and Hospital, Chennai.

Study period:
June 2024 to July 2025

Study population:

1) Functional constipation group: Children with functional constipation, in the age group of 2-12 years, of either sex
2) Normal bowel pattern group:
   - School children aged 6-12 year of either sex from two different schools catering to different socioeconomic group.
   - 2-5 year old children attending outpatient department

Inclusion criteria:
Children with functional constipation who attended Opd, who fulfilled the criteria for functional constipation according to Rome III criteria.

Exclusion criteria:
Children already on treatment for functional constipation and children with organic causes of constipation were excluded from the study.

4. Methodology

- Performa for normal bowel pattern was filled by parents and collected. (Annexure-1)
- For children with history of constipation attending opd, Stool frequency and type of stool passed was recorded for a period of one week, with Bristol stool chart being the reference for type of stool passed. The proforma were filled by parents. (Annexure -2)
- The diet pattern of these children were also recorded in a diet chart.
- The data from both groups were analyzed and compared using SPSS version 15 for windows. Categorical data were expressed as absolute counts and percentages. Continuous data were expressed as medians and interquartile range. Data were considered statistically significant at $p<0.05$. For variables in qualitative form, chi square test was used in the univariate analysis to observe the association between the study variables and the outcome.

5. Summary and Conclusion

- The prevalence of Functional constipation is 13.5% in our study
- Common age of presentation is 2-4 years with an overall female preponderance
- Functional constipation is more common in lower socioeconomic group
- Marital disharmony, sibling rivalry and school phobia have an effect on functional constipation
- Skipping of breakfast and low intake of vegetables and fruits had a significant influence on functional constipation
- Early toilet training is associated with development of constipation
- The average number of stool passed per day by children with normal bowel habit is 1.14 and it is mostly of soft consistency

Annexure I

Proforma for normal bowel pattern in children
Name:
Age/Sex:
Address:
Socioeconomic status :
Mother's education:
Working mother / Home maker
Father's education:
Income:
Family: Nuclear/ Joint/ Separated
Type of house : Hut/ Asbestos sheet/ Concrete
Type of toilet: Indian/ Western/ Open
Location of toilet : Inside / outside the house
Bowel movements: Morning / Evening / Night
Number of bowel movements per week:
Consistency of stools: Type _____ (Refer the chart enclosed)
Straining: Yes / No
Toilet training started at:
Temper tantrums: Yes / No
Recurrent headache: Yes / No
Continence achieved: Yes / No
Order of pregnancy:
Marital dysharmony: Yes / No
Single parent / Divorcee / Living separately
Sibling rivalry: Yes / No
School phobia / avoidance: Yes / No
School timing:
Start to school time:
Breakfast: At home/ At school/ Skipped
Use of school toilet: Comfortable/ Not comfortable
Type of toilet at school: Indian/ Western
Adequacy of toilet: Yes / No
Water for ablution: Yes/ No
Canteen available: Yes / No
Type of snacks sold in canteen: Yes / No
Scholastic performance:

Annexure-II

PROFORMA FOR FUNCTIONAL CONSTIPATION
Name:
Age/Sex: Height : cm Weight : Kg
Address:
Type of toilet: Western toilet / Indian toilet / Open field
Location of toilet: Inside / Outside
Complaints:
Duration:
Blood streaking of stools:
Fecal soiling:
Frequency of stools per week:
Consistency of stool:
Straining:
Recurrent abdominal pain:
Urinary symptoms:
GERD symptoms:
Bowel movements: Morning/ Evening/ Night
Abnormal posturing: Clenching teeth
Crossing legs
Squeezing buttocks together
Duration in toilet:
Faecal soiling: Yes/No
Mass descending per rectum: Yes/No
H/O digital evacuation: Yes/No
Precipitating factors:
Toilet training started at:
Temper tantrums: Yes / No
Recurrent headache: Yes / No
Continence achieved: Yes/No
Order of pregnancy:
Marital dysharmony: Yes / No
Single parent / Divorcee / Living separately
Sibling rivalry: Yes / No
School phobia/ avoidance: Yes / No
School timing:
Start to school time:
Breakfast: At home / At school/ Skipped
Use of school toilet: Comfortable/ Not comfortable
Type of toilet at school: Indian/ Western
Scholastic performance:
Past history
History of surgery:
History of drug intake:

History thyroid medications
Birth history

Meconium passed at:
Development: Delayed/Normal
Dietary history
Infants: Breast feed/ Formula feed
Older children: (To fill diet sheet)
Socioeconomic status:
Mother's education:
Working mother / Home maker
Father's education:
Income:
Housing type:
Nuclear or joint family:
General physical Examination
Anemia
Ictreus
Lymphadenopaty
Cyanosis
Clubbing
Others
Vital signs
Temperature:
Pulse rate:
Respiratory rate:
Blood pressure:
Systemic examination
Abdomen:
CVS:
RS:
CNS
Local examination
Anal opening:
Perianal area:
Fissure: