



## Research Article

# Evaluation and Management of Constipation in Children-Single Centre Study

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## Abstract

**Background:** Constipation in Indian children is on raising mode and most of it is functional; if search the figure in multiple literature constipation is a worldwide common problem in children. Developed and developing countries have equally distributed identified risk factors for constipation in both. The quality of life has affected in constipated patients and increases the mental stress of kids and parents. It also constitutes a challenge for healthcare systems and society by incurring significant burden of expenditure. All the factors specify that childhood constipation is turn up as a significant public health problem.

**Materials and methodology:** Two hundred pediatric patients within two year of study period who presenting with history suggestive of constipation were studied in terms of age, gender, presenting complaints and duration of symptoms. Constipation was assessed by proforma based history and examination including Bristol stool chart in all these patients up to 12 years of age of either sex with history suggestive of constipation included in study were patients with acute abdomen and who not following the criteria of inclusion are excluded from study. Illustrative data were measured in term of qualitative and quantitative variables. Qualitative measures like sex, presenting complaints and presenting symptoms of constipation and stool pattern, percentages and frequencies were calculated and quantitative variables like age, percentages/mean/Standard Deviation (SD) were calculated.

**Objectives:** Early diagnosis and effective treatment of constipation in children, Implementation of guidelines to provide a consistent, coordinated approach and to improve outcome for children and Compare it with the other similar studies.

**Results:** Constipation occurs comparatively frequent among children and functional type of constipation is the most common cause of constipation in pediatric patients. Stool consistency, bowel frequency, large caliber hard and painful defecation are more tactful parameters in diagnose of constipation. Age group 0 to 4 year children's are more commonly affected and male dominance is perceptible in both functional and in organic (pathologic) constipation. Functional constipation (84.5%) is the most common type of constipation presenting in children, though up to 15.5% of patients may have an organic cause in whom history of delayed passage of meconium, presence of distension of abdomen, and fecal mass in rectum are the detectable point to an organic pathology. Children who are constipated may be associated with urinary tract infection.

**Conclusion:** Early diagnosis, adequate therapeutic intervention, toilet training and regular follow up are of key importance in the management of childhood constipation. Most of the patients are functional constipation so that diagnosis can be only by proper history and physical examination; rarely required investigation. Surgical options need to be considered only when medical therapy fails.

**Keywords:** Idiopathic constipation; Refactory constipation; Functional constipation; Laxative

## Introduction

A sound and healthy children isn't always the only absence of ailment however is a vibrant state of health, characterized through physical, intellectual and social wellbeing, which facilitates to hold off childhood growth, improvement and capability consistent with the genetic makeup and socio-cultural determinants [1]. During past few decades, child health and wellbeing ratio have significantly improved, such as the control of major communicable diseases through immunization, with an about 50% reduction in infant and neonatal mortality and a large range of countries attaining the general developmental target [2]. However, a new series of challenges

is emerging. These challenges include diseases of multi factorial aetiologies inclusive of bronchial asthma, obesity, substance abuse and Functional Gastrointestinal Disorders (FGDs). FGDs in children are medical entities characterized through recurrent vomiting, chronic recurrent belly pain, and disturbed defecation without identifiable structural, anatomical or biochemical anomalies also known as Functional Constipation (FC) [3]. Constipation is a common problem in children and it accounts for 3% of visits to general pediatric clinics worldwide and as many as 30% of visits to pediatric gastroenterology clinics in developed countries [4]. Constipation is especially visible between toddlers and preschool children. In 17% to 40% of cases, constipation begins in first year of life [5]. A recent systematic review in pediatric age group reported constipation in 0.7% to 29.6% [3]. Female gender, increasing age, low socioeconomic status and educational level seemed to affect constipation prevalence [6]. Gender precise incidence of constipation also varies among research. Some research have stated no distinction in prevalence of constipation among girls and boys [6-8], whilst others determined drastically higher prevalence in girls [9,10]. Another study found a poor correlation among prevalence of constipation and age [4].

There isn't any easy definition for constipation; it has dissimilarity on different literature. In the past constipation was just described on the basis of the frequency of bowel movements per week: less than

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three times a week was defined as constipation. Looking on studies like the survey of Johanson et al. [11]. On 557 subjects, it became clear that by this way constipation is not fully defined [12]. In 1989, the first version of the Rome criteria was written, which led to standardization [12]. In 1999, Rome II criteria have been advanced to diagnose defecation disorders. Rome II criteria have been determined to be too restrictive in diagnosing defecation disorders due to fact that they did not include cardinal features of constipation (fecal incontinence) as diagnostic standard and demanded persistence of symptoms for at least three months [13-15]. The pediatric Rome III criteria were released in 2006, which certainly outline constipation in children. Functional constipation was recognized as a separate clinical entity by combination of features of fecal retention and functional constipation and in addition to that, duration of symptoms was reduced to 8 weeks [16]. Recently (in 2016) the Rome III criteria have been revised, resulting in the Rome IV criteria [17]. Constipation may be either primary or secondary to another underlying disorder. Causes of secondary constipation are medications for other ongoing illness and organic abnormalities that give a mechanical obstruction resulting in constipation. Secondary constipation must be excluded first before making confirmatory diagnosis of constipation by taking thorough history and physical examination. However, constipation may be caused by disordered colonic or anorectal function called as primary constipation [18]. Chronic constipation remains a difficult condition to treat in several kids. Surgeons have a crucial role to play in specific circumstances, following detailed investigation of the underlying causes (Table 1).

**Table 1:** Causes of constipation in children.

<b>Causes of constipation in children</b>
Functional constipation of childhood
Motility related: Hirschsprung disease, Myopathy
Congenital anomalies: Anal stenosis, Anteriorly located Anus, Spinal cord anomalies (meningomyelocele, myelomeningocele, spina bifida)
Neurological: Cerebral palsy, Mental retardation
Endocrine/metabolic: Hypothyroidism, Renal tubular acidosis, Diabetes insipidus, Hypercalcemia
Drugs: Anticonvulsants, Antipsychotic, Codeine containing anti-diarrheal

### Various definitions used in constipation patient

To date, there's no international agreement concerning the definition of constipation in children. Some researchers choose to use single symptoms like difficulty in passing stools to outline Functional Constipation (FC) [8,19]. Whereas many authorities define FC in children as a mixture of various symptoms; the Iowa criteria, Paris Consensus on Childhood Constipation Terminology (PACCT) criteria, Rome II criteria, Rome III criteria, and recently the Rome IV criteria, clearly there is no uniformity in these definitions [12,16,20-22]. Therefore, epidemiological analysis such heterogeneous criteria has provided a blurred epidemiological picture of FC [23]. In our study we follow Rome III criteria to define constipation.

**Chronic constipation:** Constipation that's lasting longer than 8 weeks.

**Idiopathic constipation:** Constipation that cannot (currently) be explained by any anatomical, physiological, radiological and histological abnormalities.

**Functional constipation:** Constipation that occurs without any objective evidence of a pathological condition.

**Intractable constipation:** Constipation that does not respond to sustained, optimum medical management.

**Refractory constipation:** Constipation not responding to optimal conventional treatment for at least 3 months, despite good compliance.

**Fecal impaction:** A hard mass in the lower abdomen found on physical examination or a dilated rectum filled with a large amount of stool on per rectal examination or excessive stool in the distal colon on abdominal Radiological examination.

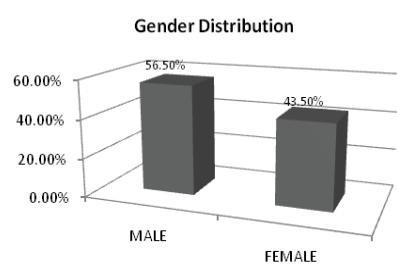
### Materials and Methods

A prospective, observational single centre study involving observation of patients came to institution to final outcome of management. Routine information like Age, Sex, Clinical history, detailed physical examination findings and other relevant data being collected from the hospital case sheets and given proforma. Age group since birth (considered as "0" year) to 12 year, both male and female are enrolled. To define constipation we use Rome III criteria as mostly accepted in many previous studies. Patients more than 12 years age and patients those are not willing for investigation and treatment are excluded from study. Patient who are not completed their follow up are also excluded. At the very first visit, detailed history was taken from the patient/caretaker (by giving proforma of questionnaire) including presenting complaints such as age at presentation, duration of constipation, bowel motion frequency, bowel motion consistency, anal pain while defecation, stool withholding behavior, presence of blood with bowel motion, fecal incontinence, and the presence of fecal impaction or an abdominal mass associated symptoms. Stool pattern identified by Bristol stool chart. General examination and physical examination, including digital per rectal examination, was done the same day. Routine blood investigation and some patients had tested with USG Abdomen, X-ray Abdomen and X-ray L-S spine had done as per clinical observation. There were some specific tests which were performed in selected patients which was Barium examination, Anorectal manometry and rectal biopsy.

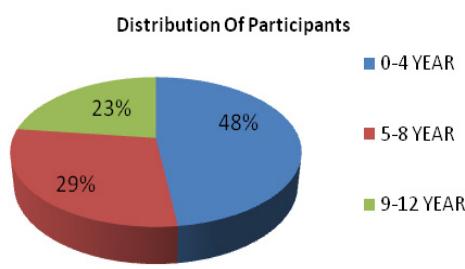
All these data filled in proforma in front of patient/caretaker. On the basis of provisional diagnosis relevant investigation are carried out and treatment advised according to NICE clinical guidelines (2010) [24]. Follow-up visits for 6 months period (2<sup>nd</sup>, 4<sup>th</sup>, 12<sup>th</sup> week and after 6 months) dates are given to patient/caretaker for further plan and observation. Follow-up done by direct through revisiting of patients or telephonically as per convenience of patient/caretaker. All data was collected and Statistical analysis was done.

### Results

A total of 200 children with constipation were included in the study. The mean age  $5.61 \pm 3.49$  years. Total 96 patients (48.0%) of the participants had Age Group: 0 to 4 Years, 58 (29.0%) of the participants had Age Group: 5 to 8 Years and age group: 9 to 12 Years had 46 (23.5%). Of the 200 patients, 113(56.5%) participants were Male, 87 (43.5%) of the participants are females. A male preponderance was noticed in all the age groups, except age group 5 to 8 years where female participants had more than male participants. Although, no substantial significant gender difference was observed in any age group. The most commonly affected age group was the 0 to 4 year children (48%) followed by age group 5-8 year (29%) and least affected children are 9-12 year age group (23.5%). The mean Duration of complaints was  $8.04 \pm 3.18$  months and ranges from 1-16 months (Figures 1 and 2) (Table 2).



**Figure 1:** Gender distribution.



**Figure 2:** Distribution of participants in age groups.

Among the clinical spectrum most of the patients having multiple complaints regarding constipation, but we have include first complaint by which presented first time. Most common complaints in participant had motion frequency once in 2-3 days 84(42%) commonly in age group 0-4 years age groups, painful defecation 39(19.5%), Abdominal pain complaint in constipated patients 29(14.5%), Straining during defecation 28(14%), hard and dry stool 20(10%), was the most common complaints by which parents/patients come to the out patients unit and maximally found in the 5-8 year age group (Table 3).

Chi-squared test was used to explore the association between 'Type of Constipation' and 'Age Group'. There was a significant difference between the various groups in terms of distribution of Age Group ( $\chi^2=16.478$ ,  $p \leq 0.001$ ). Participants in the age Group: 0 to 4 Years had larger proportion of functional constipation; 72(42%) and organic constipation 25(80.6%) respectively and least affected age Group: 9 to 12 Years 45(26.6%) and 1(3.2%) respectively (Table 4).

Chi-squared test was used to explore the association between 'Type of Constipation' and 'Gender'. There was no significant difference between the various groups in terms of distribution of Gender but high proportion of male in organic constipation ( $\chi^2=0.959$ ,  $p=0.327$ ) (Table 5).

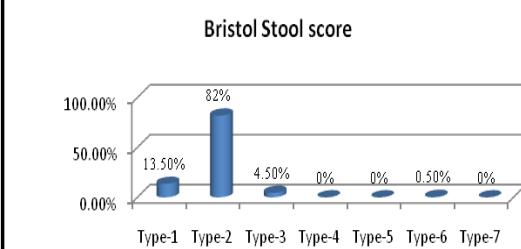
In this study Anal pain during defecation had 145(72.5%) patients and found in age group 9-12 years maximum 37(80.4%), infrequent evacuation <(2-3 weeks) was seen in more than half of the patients 130 (65%), Retentive posture 124(62%), both are maximum in 0-4 year age group 52% and 69.7% respectively and minimum in 5-8 year age group. History of Appetite either decrease or increase before and after defecation provide good information about constipation. In our study 142(70.9%) constipated children are having poor appetite which improve after complete defecation and significant in age group 5-8 years. Fecal incontinence (soiling) 58(29%) in studied participant and most commonly seen in age group 0-4 years children 38(39.5%) and

was significantly different compared to age group 5-8 years children 12(20.6%). Fecal incontinence was more prevalent in boys than girls.

Abdominal pain, blood in stools were more commonly seen in girls, but not statistically significant in our study, only distension of abdomen/vomiting 34(17%) was statistically significant and strongly association with organic constipation 25(80.6%). In 191(95.5%) of the participants had Passage of Meconium: <48 Hours of birth while 9(4.5%) of the participants had Passage of Meconium: >48 Hours after birth. Organic constipation had significantly associated with Passage of Meconium: >48 Hours (Figure 3).

Bristol stool chart for evaluation of type of stool resulting Type-2 164(82%) and second most type 1 were 27(13.5%) and type 3 had 9(4.5%). Lumpy and sausage shape stool type 2 had significant association with functional constipation (90.5%) while 54.8% type 1 separate hard lumpy stool had significant with organic constipation (Table 6).

On physical examination, soft fecal matter present in 73(36.5%) and fecal mass in rectum was found in 70(35%) children with constipation insignificant with increasing age but significant association of fecal mass with organic constipation 17(54.8%). Perianal tag/fissure was seen in 26(13.6%) of the participants. Distended abdomen present



**Figure 3:** Bristol stool score.

**Table 2:** Demographic distribution of participants.

Particulars		Result
		Mean $\pm$ SD    Median(IQR)    Min-Max
		Frequency (%)
Age (Years)		5.61 $\pm$ 3.49    5.00(2.65-8.00)    0.11-12.00
Age Group	0-4 Years	96(48.0%)
	5- 8 Years	58(29.0%)
	9-12 Years	46(23.0%)
Gender	Male	113(56.5%)
	Female	87(43.5%)

**Table 3:** Association between type of constipation and Age Group.

Age Group	Type of Constipation			Chi-Squared Test	
	Functional	Organic	Total	$\chi^2$	P Value
0 - 4 Years	71(42.0%)	25(80.6%)	96(48.0%)		
5 - 8 Years	53(31.4%)	5(16.1%)	58(29.0%)		
9 - 12 Years	45(26.6%)	1(3.2%)	46(23.0%)	16.478	<0.001
Total	169(100.0%)	31(100.0%)	200(100.0%)		

**Table 4:** Association between Type of Constipation and Gender.

Gender	Type of Constipation			Chi-Square Test	
	Functional	Organic	Total	$\chi^2$	P Value
Male	93(55.0%)	20(64.5%)	113(56.5%)		
Female	76(45.0%)	11(35.5%)	87(43.5%)	0.959	0.327
Total	169(100.0%)	31(100.0%)	200(100.0%)		

**Table 5:** Descriptive Details of Different Questionnaire.

Questionnaires	Age (Year) (n=200)			Frequency(%)	P value
	0-4 N=96(%)	5-8 N=58(%)	9-12 N=46(%)		
Bowel Movement <3 in a Week	50(52)	49(84.4)	31(67.3)	0.65	0
Large Hard Stools	73(76.04)	49(84.4)	42(91.3)	0.82	0.002
Large Caliber Stools	60(62.5)	48(82.7)	34(73.9)	0.71	0
Rabbit Droppings stool	17(17.7)	01(1.7)	02(4.3)	0.1	0.002
Soiling	38(39.5)	12(20.6)	08(17.3)	0.29	0
Poor appetite	71(73.9)	41(70.6)	29(63)	0.709	0.702
Distress on Defecation	45(46.8)	14(24.1)	12(26)	0.357	0.006
Abdominal Pain	34(35.4)	28(48.2)	18(39.1)	0.402	0.464
Retentive Posture	67(69.7)	26(44.8)	31(67.3)	0.623	0
Straining on Defecation	63(84.3)	42(72.4)	33(71.7)	0.784	0
Anal Pain During Defecation	63(65.6)	45(77.5)	37(80.4)	0.725	0
Bleeding PR During Defecation	10(10.4)	05(8.6)	08(17)	0.115	0.397
Cracks/Tears in Anal Region	15(15.6)	11(18.9)	09(19.5)	0.175	0.915
Affected Growth	23(23.9)	03(5)	04(8)	0.151	0.002
Inadequate Food/Fluid Intake	55(57.2)	40(68.9)	35(58.3)	0.65	0.053
Abdominal distension/Vomiting	24(25%)	9(15.5%)	1(3%)	0.17	0.431

in 28(14%) patients and out of which 32.2% had organic type of constipation which is significant in this study.

After evaluation of patients 169(84.5%) of the participants had Diagnosis: Functional constipation and 31(15.5%) patients had diagnosed as organic constipation including Hirschprung Disease 10(32.2%) consist of significant organic constipation 32.2% p value<0.001 had commonly affected 0 to 4 year age group with male preponderance. In 6(19.3%) of the participants had Diagnosis: Cerebral Palsy. In 4(12.9%) of the participants had Diagnosis: Down syndrome. In 3(9.6%) of the participants had Diagnosis: ARM+Anal Stenosis. In 3(9.6%) of the participants had Diagnosis: Hypothyroidism. In 3(9.6%) of the participants had Diagnosis: Spina Bifida. In 3(6.4%) of the participants had Diagnosis: Abdominal Tuberculosis out of total cases of organic constipation. Urinary tract infection was found in 12(6.7%) cases along with Hypothyroidism, Down syndrome, cerebral palsy cases (Table 7).

The age group 0-4 years were 72 patients suffering with functional constipation and 24 with organic constipation. In age group 5-8 years 52 patients were suffering from functional constipation and 6 with organic constipation. In age group 9-12 years 45 patients were suffering with function constipation and 1 with organic constipation. The total result indicates that 169(84.5%) patients were suffering with functional constipation and 31(15.5%) with organic constipation. There was a significant association between age and type of constipation as p=0.001<0.01(1% level of significance).

Total 16(8.0%) of the participants had benefited with dietary management alone and rest 184(92%) patients had managed with

**Table 6:** Examination findings association with type of constipation.

Examination Findings	Functional	Organic	Frequency(%)	P value
Soft Fecal Matter	72(42.6%)	1(3.2%)	73(36.5%)	
Fecal Mass	53(31.4%)	17(54.8%)	70(35%)	P<0.001
Fissure in Ano	26(15.3%)	0(0%)	26(13%)	
Anal Stenosis	0(0.0%)	3(9.7%)	3(1.5)	
Distended Abdomen	18(10.6%)	10(32.2%)	28(14%)	P<0.001

**Table 7:** Distribution of the participants in terms of type of constipation.

Type of Constipation	Functional	Age (Years)			Total	P value
		0-4	5-8	9-12		
Type of Constipation	Functional	72	52	45	169	
	Organic	24	6	1	31	<0.001
Total		96	58	46	200	

pharmacological, dietary, toilet training and surgical intervention. Out of 200 patients 13 received surgical treatment and 187 patients treated with non-surgical management had significant outcome. In the 6 months follow up period 64% patients completely recovered, 44(22%) had symptoms free on medication and 28(14%) had still symptomatic.

## Discussion

Constipation is mainly seen among age 0-4 years children. In 17% to 40% of cases, constipation starts in first year of life [5]. A recent systematic review shows the pediatric age group constipation in 0.7% to 29.6%. Female gender, increasing age, socioeconomic status and educational level seemed to affect constipation prevalence [6]. Many studies reported gender specific prevalence of constipation whereas other studies have reported no difference in prevalence of constipation between girls and boys [7-10], while others found significantly higher prevalence in girls [25].

In the present study, 200 patients had mean age (SD) was 5.61 ± 3.49 year (66 months), range from 0.11-12 years, most commonly affected age group was 0-4 year 96(48%) and least affected population was 9-12 year age group 46(23%); Males made up 113(56.5%) of the study population. There were no significant statistical gender differences in any age group but male preponderance was noticed both in the functional 93(55%) and organic constipation groups 20(64.5%). We found that the median (IQR) of Duration of complaints (months) was 8.00 [14-18].

Dehghani et al. [26] similar study had done and 222 children with constipation were included with a mean ± SD age of 5 ± 3.12 years (range: 1-18 years) consisting of 124(55.9%) girls and 98(44.1%) boys. Study had no statistically gender difference (P value>0.001) as similar to our study whereas female preponderance was not correlate to our study. Khanna et al. [6] similar study was done by in their study where out of 137 constipated patients 90(65%) male and 35% female mean age was 59.2(42.1) months (range, 8 months-14 years). Study had male preponderance whereas the majority, 117(85%), had Functional Constipation (FC) while the remaining 20(15%) had an associated organic disorder, similar to present study. Kondapalli et al. [27] reported in their study, the most common constipation was in the age group of 2-4 years. The least number of children were from 10-12 years, symmetrical to our study.

Most common complaints in participants had motion frequency once in 2-3 days in participant 84(42%) commonly in age group 0 to 4 years age, painful defecation 39(19.5%), Abdominal pain complaint in constipated patients 29(14.5%), straining during defecation 28(14%), hard and dry stool 20(10%), was the most common complaints by which parents/patients come to the out patients unit and maximally found in the 5-8 year age group. Altamimi et al. [28] reported in their cohort study found, 290(70.2%) participants reported having first presenting complaint in maximum participants was bowel movement less than three times per week, which had comparable to our study.

Khalil and Alkot [29] found chronic abdominal pain was the most common presenting symptom (77.9%) among the studied children. Kondapalli et al. [27] in their study, recurrent abdominal pain was the presenting complaint in 30.6% of children, it was present equally in boys and girls. Above comparative study had asymmetrical result of chief complaints may be due to misinterpretations of complaints as we discussed in review of literature as the pain abdomen may be associated with constipation but other cause of constipation has to consider.

A brief history and physical examination are sufficient to diagnose functional constipation. Hard stool consistency and painful defecation and large caliber stool was found to be significant symptom of pediatric constipation, and found in about 82%, 72.5% and 71% cases respectively in this study and significantly associated with functional constipation and organic constipation. Dehghani et al. [26] reported similar study where 93% cases hard and painful defecation comparable to our study; Bansal et al. [30] suggested hard; dry and painful defecation was the most consistent complaint (85.26%) across all age groups comparable to present study.

In the present study 65% patient had stool frequency less than three per week whereas Kondapalli et al. [27] reported 162 (80.1%) of children had stool frequency of <3 per week and 104 of them passed stools twice in a week comparable to present study. In other study Khalil and Alkot et al. [29] reported 92% of children was stool frequency of less than three bowel motions per week and tend to defecate once every  $4.40 \pm 3.54$  days higher than our study. All these finding was in agreement with previous studies. Hence, it is suggested that stool consistency and painful defecation is more sensitive parameter to diagnose constipation in pediatric patients. The most important features in the history, which help to distinguish Hirschsprung's disease from functional constipation, are onset in first month of life and delayed passage of meconium beyond 48 hours and the most important examination finding is empty rectum on digital rectal examination [5,6]. In present study 29% had passage of stool 48 hour after birth and 99% of them consist of organic pathology of constipation, which is highly significant ( $p$  value <0.001). Khanna et al. [6] study reported similar comparable result as present study.

In our study Fecal soiling 64.5% Rabbit droppings 45.2%, poor appetite near to 100% retentive posture 90.3% and straining on defecation 96.8%. These are significant parameters associated with constipation due to organic cause. Khanna et al. [6], Dehghani et al. [26] have reported comparable result and suggested, fecal incontinence signifies severity of constipation. The Bristol stool scale, an evidence based tool, it is helpful to use with children and their parents to accurately determine the consistency of the child's stool. In present study the Bristol stool chart for evaluation of type of stool resulting Type-2 (Lumpy and sausage shape) 164(82%) and second most type 1 (separated hard lump) were 27(13.5%) and Type 3

(sausage shape with crack on surface) had 9(4.5%). Participants in the group of Functional constipation had the larger proportion of Bristol Stool Chart: Type 2 and Participants in the group organic constipation had type 1 Bristol stool type ( $\chi^2=34.619$ ,  $p=<0.001$ ).

Altamimi et al. [28] reported in their study Bristol stool type -2 was 75% in studied population and Functional constipation had the larger proportion of Bristol Stool Chart: Type 2 and Participants in the group organic constipation had type 1, these significant data was comparable to our study. Whereas Kondapalli et al. [27] was done comparable study and reported the stool type in their study, type I in 18(8.9%) and type II in 75(37.1%) and type III in 104(51.4%), type IV in 5(2.47%) according to the Bristol stool chart. Difference may be due to observational misinterpretation of stool type by participants or parents.

On physical examination, the main aim of the abdominal examination is to assess the presence of palpable fecal mass. Fecal mass present in 70(35%) cases out of which 17(54.8%) consist of organic constipation. It suggest palpable fecal mass has significant association with constipation due to organic cause. Abdominal distension found in 28(14%) cases were 10(32.2%) significant ( $p$  value<.001) found in organic cause. Previous studies Khanna et al. [6] had similar significant data to support our study.

Laboratory investigations and Radiological studies are rarely indicated in childhood constipation except in those with evidence of organic diseases from history and examination and in those who do not respond to adequate medical management. Otherwise, investigations are unlikely to reveal any additional information for the management. Present study revealed statically significant of radiological and laboratory investigation in organic constipation.

In our study 12(7.17%) participant had Urinary Tract Infection (UTI) associated with constipation suggest UTI also a acute cause of pediatric constipation along with chronic constipation. Similarly Muhammad et al. [31] reported in their study and found 37.5% cases where incidence is high due to including long duration of studied population. Constipation is frequent and overlooked problem in pediatric patients having urinary symptoms. Children up to 5 years of age are the most common sufferers.

Our study revealed about 15.5% had an organic cause for constipation and 84.5% patients had functional cause of constipation. The total result indicates that 169 patients were suffering with functional constipation and 31 with organic constipation (Hirschsprung disease 32.2%). Age group 0-4 years had high prevalence of functional constipation and organic causes of constipation with male preponderance. There was a significant association between age and type of constipation as  $p=0.001<0.01$ (1% level of significance). Bansal et al. [30] reported near similar result in their study 13% of patients had an organic cause for constipation. HD was responsible for 50% of cases of organic constipation and comprised 6.41% of the total cases of constipation. All cases of HD were associated with delayed passage of meconium. These results are in agreement with previous studies Loening-Baucke [32] and Guerreiro et al. [33] which showed the prevalence of organic constipation to be 14.6% and 18.3%, respectively. Khanna et al. [6], reported similar result in their study. These figures are higher the approximately 5% to 10% prevalence reported from developed countries [34,35]. History of delayed passage of meconium, abdominal distension are suggestive of an organic pathology, our study reinforces this fact.

## Management

Pharmacological, Dietary modification and Toilet Training combined had significant management techniques 53.5% in management of functional constipation were only 6.5% patient has to treated along with surgical intervention  $p < 0.001$ (1% level of significance). This successful result had found in our study by combined use of two oral medications; an osmotic and a stimulant laxative with no need to rectal suppositories or enemas [36]. Our study revealed 128(64%) patients fully recovered after completing follow-up visit 4<sup>th</sup> (6 months), 44(22%) Symptoms free on medication and 28(14%) patient still symptomatic on on-going medicine, these required more follow-up and advised continue follow-up till 12 months. Candy and Belsey [37] reported similar result in their study [19]. Oral disimpaction is a successful and child-friendly way of disimpaction even in markedly impacted patients.

At the end of the study, all of the studied children were advised to not stop their regular visits to the follow-up in order to continue their maintenance therapy at least 6-24 months according to the clinical improvement of each patient.

## Conclusion

Early diagnosis, adequate therapeutic intervention, toilet training and regular follow up are of key importance in the management of childhood constipation. Most of the patients are functional constipation so that diagnosis can be only by proper history and physical examination; rarely required investigation. Surgical options need to be considered only when medical therapy fails. We hope this study will increase the awareness about functional constipation in India and pediatricians/pediatric surgeons will stop investigating to all cases of constipation for functional constipation.

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