

# Constipation in Pediatric Patients with Lower Urinary Tract Symptoms

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## ABSTRACT

**Objective:** To determine the frequency of constipation in patients with pediatric age group presenting with Lower Urinary Tract Symptoms (LUTS).

**Study Design:** Descriptive study.

**Place and Duration of Study:** Outpatient Department of Urology in Pakistan Kidney Institute at Shifa International Hospital, Islamabad, from November 2012 to February 2014.

**Methodology:** Two hundred pediatric patients presenting with Lower Urinary Tract Symptoms (LUTS) were studied in terms of age, gender, obstructive and irritative types of LUTS along with any associated symptoms. Constipation was assessed by Bristol stool chart in these patients. Patients with exstrophy of bladder were excluded from the study. Descriptive statistics were measured for both qualitative and quantitative variables. For qualitative variables like gender, presenting symptoms, constipation and stool types, percentages and frequencies were calculated. For quantitative variables like age, percentages / mean  $\pm$ SD were calculated.

**Results:** Mean age was 6.87  $\pm$ 3.64 years with a range of 2 - 14 years. Constipation was found in 37.5% of the pediatric patients with lower urinary tract symptoms.

**Conclusion:** Constipation is frequent and overlooked problem in pediatric patients having urinary symptoms. Irritative lower urinary tract symptoms are more common. Children up to 5 years of age are the most common sufferers. Knowing the burden of constipation in such patients can help physicians in better treatment of such cases.

**Key Words:** Lower urinary tract symptoms. Constipation. Pediatrics. Children.

## INTRODUCTION

Constipation and Lower Urinary Tract Symptoms (LUTS) can occur concomitantly in different patients including children, women, and elderly as well as in neuropathic patients. As urinary bladder and rectum have a common embryological origin with similar autonomic and somatic innervations, dysfunction in one may influence the function of the other, including mechanical hindrance. The bladder is unable to store and empty itself completely if the child is constipated having a large amount of stool in the rectum or bowel. Hence the defecation problems and LUTS can be present simultaneously.<sup>1</sup> and this condition is often known as Bladder Bowel Dysfunction (BBD). The signs of constipation may include less than 3 bowel movements per week, passing large stools that block the toilet, or pain when trying to go to the bathroom due to hard and dry bowel movements as well as trouble pushing the stools out of the rectum. There can be associated backache and abdomen may look bloated with soiling of children underwear with liquid or soft stools. Different criteria and scales have been used to assess constipation. The Rome III criteria, Bristol scale, and

Leech score, alone and together, have been used and results have shown that each criterion has the same strength and can be applied comprehensively and generally.<sup>2</sup>

Bristol stool chart (Figure 1) divides stool in seven different types, depending on its shape. Types 1-2 indicate constipation, while 3 and 4 being the "ideal stool"; especially the former, as they are easy to defecate while not containing any excess liquid, and 5, 6 and 7 tending towards diarrhea.

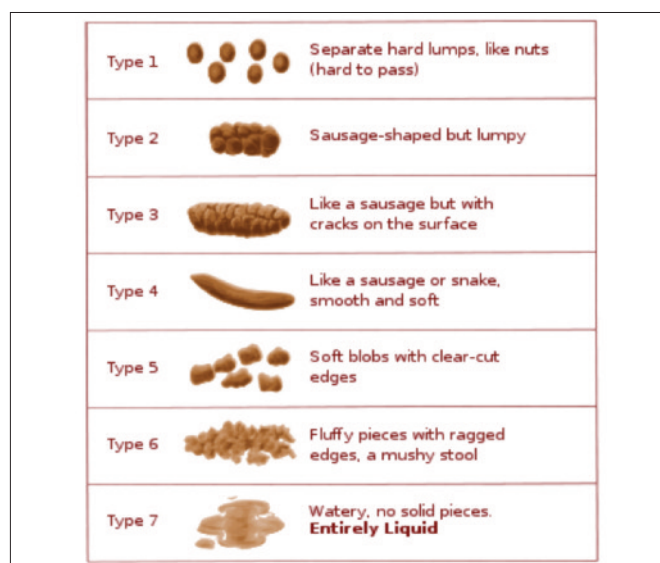


Figure 1: Bristol stool chart.

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Constipation is generally overlooked in children with LUTS and is less studied in our part of the world (Pakistan) and other countries in South East Asia.

This study aimed to determine the burden of constipation in pediatric population with LUTS, which would help physicians to treat such cases in a better way.

## METHODOLOGY

This is a descriptive cross-sectional study, conducted in Outpatient Department of Urology in Pakistan Kidney Institute at Shifa International Hospital (S.I.H), Islamabad. The duration of the study was fifteen months starting from November 2012 till February 2014. Sample size was calculated by using WHO sample size calculator, keeping  $P = 9\%$ ,<sup>3</sup> and absolute precision required =  $4\%$ ,  $n = 200$  patients. Consecutive non-probability sampling was done. All pediatric patients of 2 - 14 years of age of either gender with LUTS, irrespective of its duration, intensity or prior treatment, were included in the study. The data was collected by a well designed questionnaire and the variables included name, age, gender, registration number and respective symptoms of the patients. Patients with exstrophy of bladder were excluded.

Approval from ethical committee and an informed consent from parents were taken. All the patients fulfilling the inclusion criteria were subjected to detailed history by researcher and constipation was assessed by Bristol stool chart which was filled by the researcher with the help of guardians directly involved in children's care, mostly mothers. Patients were advised to follow-up in OPD for routine clinical checkup.

The symptoms were divided into three categories including irritative symptoms,<sup>4</sup> obstructive symptoms and any other symptoms. Irritative symptoms were defined as frequency  $\geq 8$  times urination/day, nocturia  $\geq 1$  time urination/night, urgency which means strong sudden desire to urinate. Urge incontinence which

means loss of small amount of urine during urgency and dysuria, i.e. painful micturition, and burning micturition were also included in irritative symptoms. Obstructive symptoms were defined as hesitancy which means difficulty in starting urination, intermittency, i.e. interruption of stream, sense of incomplete emptying, post urination/void dribbling. Poor stream and history of retention of urine were also included in this category.

Data was entered and analyzed in SPSS Version 16.0 (Chicago, IL, USA). Descriptive statistics were measured for both qualitative and quantitative variables. For qualitative variables like gender, presenting symptoms, constipation and stool types, percentages and frequencies were calculated. For quantitative variables like age, percentages /mean  $\pm$  SD were calculated.

Percentages were calculated by dividing the number of patients with respective symptoms from total number of patients.

## RESULTS

A total number of 200 children with various lower urinary tract symptoms were enrolled in this study. The age of participants ranged from 2 to 14 years (Table I).

Frequencies of various LUTS have been described in Table II. Certain irritative symptoms were found in combination. Burning micturition with hematuria were found in 9 (4.5%) children, frequency with burning in 8 (4%), urgency with burning in 10 (5%) and frequency with urgency was found in 12 (6%) children. Eight (4%) patients had nocturia, enuresis with dysuria and 12 (6%) children had frequency, urgency with urge incontinence. Straining combined with poor stream was found in 15 (7.5%) children and 3 (1.5%) children had hesitancy with intermittency.

There were 18 (9%) children with type 1 stools, 57 (28.5%) children had type 2 stool, and 36 (18%) patients had type 3, 37 (18.5%) patients had type 4, 20 (10%) had type 5, 27 (13.5%) had type 6 and 5 (2.5%) children had type 7 stools.

As type 1 and type 2 was taken as constipation, so 75 (37.5%) out of 200 children had constipation. Type 3 and type 4 was taken as ideal stools, so 73 (36.5%) out of

**Table I:** Age and gender.

	Total participants	Boys	Girls
No. of patients	200	110 (55%)	90 (45%)
Mean age	6.87 $\pm$ 3.64	6.59 $\pm$ 3.63	7.22 $\pm$ 3.63

**Table II:** Lower urinary tract symptoms.

Irritative symptoms	No. of patient (%)	Obstructive symptoms	No. of patients/ percentages	Associated symptoms	No. of patients (%)
Total	178 (89%)	Total	109 (54.5%)	Pain abdomen	54 (27%)
Frequency	29 (14.5%)	Hesitancy	17 (8.5%)	Fever	16 (8%)
Nocturia	6 (3%)	Intermittency	10 (5%)	Pain abdomen with occasional fever	5 (2.5%)
Hematuria	8 (4%)	Poor stream	6 (3%)	Fever with active UTI's	6 (3%)
Pyuria	7 (3.5%)	Splaying of stream	9 (4.5%)	Fever with recurrent UTI's	9 (4.5%)
Urgency	7 (3.5%)	Sense of incomplete emptying	11 (5.5%)	Pain with recurrent UTI's	9 (4.5%)
Urge incontinence	6 (3%)	Post void dribbling	11 (5.5%)	Fever with pain and UTI	6 (3%)
Dysuria	17 (8.5%)	Single episode of retention of urine	8 (4%)	Associated lower limb weakness	1 (0.5%)
Burning	23 (11.5%)	Recurrent retention of urine	2 (1%)	-	-
Nocturnal enuresis	16 (8%)	Occasional dribbling	17 (8.5%)	-	-

200 children had ideal stools. Type 5, 6 and 7 was taken as loose stools so 52 (26%) out of 200 children had comparatively loose stools.

Out of 18 children with type 1 stools, 12 were boys and 6 were girls and out of 57 children with type 2 stools, 30 were boys and 27 were girls. Combining the two types, 42 boys (21%) were constipated out of 200 and 33 (16.5%) girls out of 200 were constipated. Out of all the constipated patients, 56% were boys and 44% were girls. Constipation was present in 48 (24%) out of 200 patients with obstructive LUTS, 65 (32.5%) patients of irritative LUTS had constipation and 50 (25%) patients with associated diseases had constipation. In age group of up to 5 years, a total of 36 patients had constipation (14 ± 22 patients of type 1 and type 2 stools respectively). From 5 - 10 years of age group, 20 patients had constipation (3+17 patients of type 1 and type 2 stools respectively) and from 10 - 14 years of age group 19 children had constipation (1+18 patients of type 1 and type 2 stools respectively). Out of a total 37.5% (75/200) of population with constipation, only 15% had UTI and remaining 22.5% did not have UTI.

Irritative symptoms were found in 58% (113/200 patients) with ideal or loose stools and 29% (58 patients) had obstructive symptoms with ideal or loose stools.

## DISCUSSION

Lower Urinary Tract Symptoms (LUTS), both obstructive and irritative types, are a common urological problem in patients of pediatric population. Similarly, constipation alone is also a very common disease but very limited and conflicting data are available on LUTS and constipation together in correlation with each other, especially in children.<sup>5,6</sup>

Sample size in our study was 200 patients, which is comparable to an Australian study by McGrath & Caldwell, in which sample size was 277 patients.<sup>7</sup> Our mean age was 6.87 years as compared to 8.6 years in previously mentioned study and 5.7 ± 2.7 years in an Iranian study.<sup>8</sup>

More work has been done on constipated children with LUTS and associated diseases, rather than on pediatric patients with LUTS having associated constipation. For example, Loening-Baucke assessed 234 children having chronic constipation with daytime urinary incontinence in 29% and urinary tract infection in 11% of the patients.<sup>9</sup> In children with nocturnal enuresis, the prevalence rate of constipation was 36.1%, which is significantly higher than internationally reported prevalence rates of 0.7% to 29.6% in the normal population.<sup>7</sup> Similarly, the prevalence rate for constipation was 22.6% in general population but similar in boys and girls in another study by Loening-Baucke.<sup>2</sup>

The frequency of constipation in this study population was 4.5%, more prevalent in boys (21%) as compared to

girls (16.5%); most likely because of comparatively more number of boys enrolled in the study than girls, severity of associated LUTS, urinary tract infections, different socio-cultural circumstances, difference of diets, water intake, physical activity and age.

No data is available on constipation in children with LUTS in Pakistan. In one of the studies, Iqbal A Memon *et al.* aimed at finding the incidence and cause of abdominal pain in general population of pediatric age group, where constipation was found in 3% of patients with pain abdomen while in this study 12.5% of the patients presented to us with pain abdomen and constipation most likely because of socio-geographic differences.

The data from neighbouring countries differs widely. The prevalence of constipation in patients with LUTS in pediatric population was documented to be 36.1% in an Australian study.<sup>7</sup> In a Korean study by Kim *et al.*, frequency of constipation in patients with over active bladder was 30% according to Bristol stool chart.<sup>6</sup> Similarly, in a Brazilian study, Maria Luiza Veiga *et al.* found that children with isolated overactive bladder have a greater risk of having constipation compared to those with no urinary symptoms. (54.9% vs. 29.7%).<sup>11</sup>

Hadjizadeh *et al.* showed 65.3% of voiding dysfunction in children with constipation which is a significantly high prevalence rate.<sup>8</sup> Bael *et al.* studied a cohort of patients with irritative LUTS in which 32% of the patients had constipation with functional fecal incontinence and after treatment, the fecal incontinence rate dropped to 21%.<sup>12</sup> The prevalence of constipation in patients with LUTS in pediatric population in this study was (37.5%) which is quite close to the results of similar above-mentioned studies done in the history.

Most of the LUTS will resolve with successful treatment of constipation. Consequently, in Loening-Baucke study, after 12 months of successful treatment of constipation, resolution of daytime urinary incontinence occurred in 89% and urinary tract infection in all patients with normal urinary tract anatomy.<sup>2</sup> Similarly, in an American study of 143 children with Vesicoureteral reflux, Koff Stephen *et al.* concluded that the evaluation and management of dysfunctional elimination syndromes should be an integral part of the treatment of every child with vesicoureteral reflux.<sup>13</sup> As patients with bladder bowel dysfunction need multidisciplinary treatment approach,<sup>14</sup> managing bowel symptoms before intervening for bladder dysfunction in these children is an appropriate option.<sup>15</sup>

Factors other than above, the method of collecting the data may also play a major role in such variability in the results of different studies e.g. face-to-face interview by physician as compared to a questionnaire filled by the patient for collecting the data. Neurogenic bladder was not included in the exclusion criteria and hence it is one

of the study limitations. This study represents data from a single centre and further studies are needed to be done on national level to see the prevalence of constipation in all pediatric patients presenting with LUTS.

### CONCLUSION

Constipation is frequently found as overlooked problem in pediatric patients with LUTS. The evidence available so far, therefore, strongly suggests an important relationship between the two. Proper attention to associated bowel dysfunction is hence important in overall management of children with bladder dysfunctions. The knowledge of burden of constipation in pediatric population with LUTS can help physicians to provide better treatment in such cases.

**Disclosure:** This is a dissertation based study.

### REFERENCES

1. Averbeck MA, Madersbacher H. Constipation and LUTS - how do they affect each other? *Int Braz J Urol* 2011; **37**:16.
2. Loening-Baucke V. Prevalence rates for constipation and faecal and urinary incontinence. *Arch Dis Child* 2007; **92**:486-9.
3. Afzal NA, Tighe MP, Thomson MA. Constipation in children. *Ital J Pediatr* 2011; **37**:28.
4. Domochoowski RR. Bladder outlet obstruction: Etiology and evaluation. *Rev Urol* 2005; **7(suppl 6)**:S3-13.
5. Chase JW, Homsy Y, Siggaard C, Sit F, Bower WF. Functional constipation in children. *J Urol* 2004; **171**:2641-3.
6. Ostaszkievicz J, Ski C, Hornby L. Does successful treatment of constipation or faecal impaction resolve lower urinary tract symptoms: a structured review of the literature. Systematic review. *ANZC J* 2005; **11**:70,72,74-75,77,80.
7. McGrath KH, Caldwell PH, Jones MP. The frequency of constipation in children with nocturnal enuresis: a comparison with parental reporting. *J Paediatr Child Health* 2008; **44**:19-27.
8. Hadjizadeh N, Motamed F, Abdollahzade S, Rafiei S. Association of voiding dysfunction with functional constipation. *Indian Pediatr* 2009; **46**:1093-5.
9. Loening-Baucke V. Urinary incontinence and urinary tract infection and their resolution with treatment of chronic constipation of childhood. *Pediatrics* 1997; **100**:228-32.
10. Kim JH, Lee JH, Jung AY, Lee JW. The prevalence and therapeutic effect of constipation in pediatric overactive bladder. *Int Neurourol J* 2011; **15**:206-10.
11. Veiga, Maria Luiza. Constipation in children with isolated overactive bladders. *J P Urol* 2013; **9**: 945-9.
12. Bael AM, Benninga MA, Lax H, Bachmann H, Janhsen E, De Jong TP, *et al*. Functional urinary and fecal incontinence in neurologically normal children: symptoms of one 'functional elimination disorder'? *BJU Int* 2007; **99**:407-12.
13. Koff Stephen A. The relationship among dysfunctional elimination syndromes, primary vesicoureteral reflux and urinary tract infections in children. *J Urol* 1998; **160**: 1019-22.
14. Christensen, Cortney. Bladder and bowel dysfunction: evidence for multidisciplinary care. *J Urol* 2013; 1864-8.
15. Borch L. Bladder and bowel dysfunction and the resolution of urinary incontinence with successful management of bowel symptoms in children. *Acta Paediatr* 2013; **102**:e215-20.

