



Prevalence of Bladder and Bowel Dysfunction in Children Scheduled for Outpatient Surgery: Evaluation of Functional Constipation and Lower Urinary Tract Symptoms

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Abstract

Introduction: To evaluate the frequency of bladder and bowel dysfunction (BBD), functional constipation, and lower urinary tract symptoms in pediatric patients undergoing outpatient surgical procedures.

Methods: This prospective study included 100 children aged 5–18 years who were scheduled for circumcision, inguinal or umbilical hernia repair, or orchiopexy between August and December 2024. Bowel dysfunction was assessed using the Rome IV criteria, and urinary symptoms were evaluated with the Voiding and Bowel Dysfunction Symptom Score (VBDS). Patients with chronic diseases or previous urological/anorectal surgery were excluded.

Results: The mean age was 7.22 ± 2.90 years, and 97% of patients were male. At least one lower urinary tract symptom was present in 47% of patients. VBDS scores ≥ 7 were detected in 18% of participants, but only 5% met the Rome IV criteria for functional constipation. The most common symptom was stool-holding behavior (44%), while only 2% had fecal incontinence. BBD was diagnosed in one patient (1%).

Discussion and Conclusion: Although the formal diagnosis of BBD was rare, urinary and bowel-related symptoms were common. Early identification and combined evaluation of urinary and bowel functions are essential for timely intervention and to prevent potential complications.

Keywords: Bladder and bowel dysfunction; functional constipation; lower urinary tract symptoms; pediatric surgery; Rome IV criteria.

Bladder and bowel dysfunction (BBD) refers to a group of lower urinary tract symptoms associated with bowel problems. Although its true incidence is not precisely known, it is estimated to account for approximately 40% of pediatric urology consultations [1].

Bowel dysfunctions include clinical conditions such as fecal incontinence (FI) and constipation. To establish a common language and standardize evaluation across the globe, the

Rome IV criteria are recommended for the assessment of bowel dysfunction [2].

Today, the importance of bowel health in bladder function is widely recognized, and constipation has been identified as the primary bowel disorder contributing to bladder symptoms [3]. Accordingly, the early identification and treatment of BBD is critically important in order to prevent secondary comorbidities that may adversely affect renal and bladder function [4].

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In this study, we aimed to determine the frequency of BBD in pediatric patients who were admitted for outpatient surgical procedures such as circumcision, inguinal or umbilical hernia repair, or orchiopexy in the pediatric surgery department.

Materials and Methods

Following approval from the Clinical Research Ethics Committee of Ümraniye Training and Research Hospital (Approval No: 215, Date: July 11, 2024), pediatric patients aged 5 to 18 years who were scheduled for outpatient surgical procedures (inguinal/umbilical hernia, undescended testis, or circumcision) between August 15 and December 15, 2024, were prospectively enrolled in the study. The study was conducted in accordance with the principles of the Declaration of Helsinki. Informed consent was obtained from the parents of all participants. Demographic data and body mass index (BMI) values were recorded for all patients, and physical examinations were performed.

Bowel dysfunction was assessed according to the Rome IV criteria. These include the following six features: at least one episode of fecal incontinence per week, a history of retentive posturing or excessive voluntary stool retention, a history of painful or hard bowel movements, the presence of a large fecal mass in the rectum, and a history of large-diameter stools that may clog the toilet. Functional constipation was defined as the presence of at least two of these features occurring at least once per week for a minimum of one month.

Lower urinary tract symptoms were evaluated using a 13-item Voiding and Bowel Dysfunction Symptom Score (VBDS) form. This form assessed the bladder filling and voiding phases, as well as bowel habits. It was completed by a trained nurse through interviews with the child and their parent. The age at which the child achieved daytime and

nighttime continence was also recorded. Each symptom in the form was scored on a scale from 0 to 3, where 0 indicated the absence of the symptom and 3 represented the daily presence of the symptom.

Children with a history of anorectal or urological surgery, or those with chronic systemic diseases, were excluded from the study.

Statistical Analysis

The data were analyzed using IBM SPSS Statistics Standard Concurrent User V29 (IBM Corp., Armonk, New York, USA). Descriptive statistics were presented as number of cases (n), percentage (%), mean±standard deviation, median, minimum, and maximum values.

Results

A total of 100 patients with a mean age of 7.22 ± 2.90 years were included in the study. Of these, 97 were boys and 3 were girls. The mean body mass index (BMI) was 17.65 ± 4.52 (range: 11.9–32.7). Based on BMI classification, 75 patients were underweight, 17 were of normal weight, 4 were overweight, and 4 were obese.

The distribution of surgical procedures was as follows: 11 patients underwent inguinal hernia repair, 8 underwent orchiopexy for undescended testis, 5 had hydrocele surgery, 1 patient underwent umbilical hernia repair, and 75 underwent circumcision alone. Additionally, 6 patients underwent circumcision in conjunction with their primary surgical procedure.

At least one lower urinary tract symptom was identified in 47 patients (47%), while 15 patients had more than one urinary symptom. The comparison of lower urinary tract symptoms among all patients and subgroups based on the Rome IV criteria is presented in Table 1. A history of febrile urinary tract infection was noted in 14 patients.

Table 1. Comparison of Lower Urinary Tract Symptoms Among All Patients and Subgroups Based on Rome IV Criteria

Symptom	All Patients (n=100)	Rome IV Positive (n=5)	Rome IV Criterion Only 1 (n=18)
History of urinary tract infection	14 (14.0)	1 (20.0)	4 (22.2)
Nocturnal enuresis	17 (17.0)	1 (20.0)	3 (16.7)
Daytime urinary incontinence	8 (8.0)	–	1 (5.6)
Intermittent voiding	9 (9.0)	–	4 (22.2)
Urgency	12 (12.0)	1 (20.0)	–
Dysuria	8 (8.0)	–	1 (5.6)
≥1 urinary symptom	47 (47.0)	2 (40.0)	8 (44.4)
>1 urinary symptom	15 (15.0)	1 (20.0)	4 (22.2)

Values are presented as number of patients (n) and percentage (%). “–” indicates that the symptom was not reported in the group.

According to the VBDS assessment, 18 patients (18%) had a score of 7 or higher. Of these, only one patient (5.5%) met two or more Rome IV criteria.

Five patients (5%) met at least two of the Rome IV criteria. Among the 95 patients (95%) who did not meet the Rome IV criteria, 81 reported daily defecation. In contrast, 19 patients had an average of three bowel movements per week, and 11 patients experienced painful and hard defecation. Of these 11, 7 were among the patients who defecated daily.

Fecal incontinence was reported in only 2 patients (2%). A total of 15 patients experienced defecation with stool large enough to clog the toilet. Delayed defecation or stool-holding behavior was observed in 44 patients. Eighteen patients (18%) met only one of the Rome IV criteria.

Discussion

Since 2013, the coexistence of voiding dysfunction symptoms and functional constipation and/or fecal incontinence (FI) in children has been referred to as bladder and bowel dysfunction (BBD), a condition that is considered quite common worldwide. Studies have shown that more than 17% of school-aged children experience long-term urinary tract symptoms, and the prevalence of constipation and/or FI ranges between 0.7% and 29.6% [5]. In our study, only one patient (1%) fully met the Rome IV criteria and was diagnosed with BBD, subsequently being referred to the relevant specialties.

The most common cause of functional constipation (FC) is stool-withholding behavior that begins after an episode of painful, hard, or frightening defecation [6]. Constipation is a frequent childhood condition with a global prevalence of up to 29.6% [7]. However, families do not always perceive it as a medical issue [8]. Additionally, children's understanding of constipation may vary; some define it as straining or passing hard stools, while others associate it with infrequent bowel movements or the inability to defecate when desired [9].

Although rates of painful defecation vary in the literature, one study reported this symptom in 92.3% of patients, large and hard stool in 93.7%, and fecal incontinence in 31% [10]. In our study, despite not fulfilling the full Rome IV criteria, the most frequent symptom was stool-holding behavior, present in 44% of patients. Stool retained in the rectum leads to water absorption by the rectal mucosa, making the stool harder and more difficult to evacuate. Consequently, rectal distension may exert pressure on the posterior

wall of the bladder [6]. Families were informed about the importance of recognizing these symptoms as early indicators of potential BBD, and behavioral interventions were recommended for the children.

Bowel dysfunction can be characterized by constipation alone, fecal incontinence alone, or a combination of both [11]. The Rome IV criteria are currently the most widely used diagnostic tool in pediatric practice for the evaluation of FC. However, these criteria are not suitable for assessing the severity of bowel dysfunction [12]. In our study, approximately half of the patients had only one of the Rome IV criteria.

Early diagnosis and treatment of BBD are essential to protect renal and bladder function and to support the psychosocial well-being of affected children [4]. There is now broad consensus that treating bowel dysfunction effectively plays a significant role in resolving urinary dysfunction [13].

Although our study was conducted over a short period and with a limited number of patients, findings indicate that nearly half of the patients experienced either lower urinary tract symptoms or defecation problems. However, the majority did not fully meet the Rome IV criteria, and their VBDS scores remained below the diagnostic threshold for BBD. Despite the low rate of confirmed BBD, this study provides valuable insights into raising awareness among families and children. Children identified with symptoms were referred to pediatric urology and gastroenterology clinics for further evaluation, aiming to prevent progression of potential complications.

Conclusion

Bladder and bowel dysfunction (BBD) is frequently associated with urinary and defecation symptoms in children. Although the confirmed diagnosis rate based on Rome IV criteria was low in our study, many patients exhibited related symptoms, particularly stool-holding behavior. These findings highlight the importance of early recognition and holistic evaluation of urinary and gastrointestinal functions. Raising family awareness and timely referrals are key to preventing complications and improving outcomes.

Ethics Committee Approval: The study was approved by Ümraniye Training and Research Hospital Ethics Committee (No: 215, Date: 11.07.2024).

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