

Original Article

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An Overview of Treatment in Pediatric Bladder-Bowel Dysfunction: A single-centre experience

Özoğar et al. Treatment in Pediatric Bladder-Bowel Dysfunction

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Abstract

Objective: This study aimed to evaluate the clinical characteristics, treatment responses, and outcomes of pediatric patients diagnosed with bladder-bowel dysfunction, highlighting a structured management approach including urotherapy, pharmacotherapy, and rehabilitation techniques.

Materials and Methods: A retrospective study was conducted of 1846 children aged 5–18 years diagnosed with bladder-bowel dysfunction at Bakırçay University Çiğli Training and Research Hospital between 2022 and 2025. Patients with neurological disorders were excluded. Data on demographics, bladder-bowel symptom scores, treatment modalities, uroflowmetry results, and outcomes were collected. Conservative treatments included osmotic-laxatives and urotherapy. Patients unresponsive to initial therapies received antimuscarinics, biofeedback, and transcutaneous electrical nerve stimulation where appropriate.

Results: The mean age was 104.4 months. Female predominance was observed (67%). Conservative management alone successfully resolved symptoms in 512 patients without vesicoureteral reflux or recurrent urinary tract infections. Patients with higher bladder-bowel symptom score (>20) and pathological uroflowmetry required biofeedback and, in some cases, transcutaneous electrical nerve stimulation. No relapse was observed in any subgroup during the 6-month follow-up. Effective constipation management and lifestyle modifications were critical for treatment success.

Conclusion: A stepwise treatment protocol focusing on bowel regulation, urotherapy, and individualized interventions provides effective symptom control and prevents disease progression in pediatric bladder-bowel dysfunction. Early diagnosis, attention to modifiable risk factors such as constipation, and long-term adherence to behavioral strategies are essential for optimal outcomes. Prospective studies with extended follow-up are warranted.

Keywords: Bladder-bowel dysfunction, children, urotherapy, constipation, biofeedback, TENS

Introduction

Bladder-bowel dysfunction (BBD) refers to a set of lower urinary tract symptoms that are often accompanied by bowel complaints¹. Lower urinary tract symptoms can take many forms. They may present with symptoms such as urinary incontinence, abnormal daily urination frequency, urge to urinate, hesitancy during urination, straining during urination, weak urine stream, intermittent urination, and dysuria². Bowel dysfunction is often in the form of primary

constipation and/or faecal incontinence². The prevalence of BBD in school-age children is between 9% and 21% in the literature^{3,4}. The Bladder-Bowel Dysfunction Symptom Score (BBDSS) is used to screen for, diagnose, and evaluate the treatment outcome of BBD⁵. Standard urotherapy for both the patient and family involves nonpharmacologic and nonsurgical management, consisting of education and behavioural management, using a bladder and bowel diary, and regular follow-up⁶. It includes voiding function and demystification, proper and regular bladder and bowel habits, and balanced fluid intake and diet^{6,7}. In the literature, the prevalence of BBD was reported as 9.1% in a study covering 829 pediatric patients. It was understood that the probability of lower urinary tract problems was 6.8 times higher in children with constipation complaints⁴. Standard urotherapy and constipation management form the basis of BBD treatment. Pharmacotherapy and surgical treatment of lower urinary tract dysfunction should only be considered in cases that fully comply with first-line treatment but do not respond. If cases treated with urotherapy and constipation management do not respond, medical treatments should be initiated. In cases that do not respond to medical treatment, rehabilitation methods other than pharmacological treatments should be considered, given the close interaction between the bladder and the bowel due to their shared innervation and associated pelvic floor muscles⁸. These methods are classified as biofeedback, pelvic floor physiotherapy, and neuromodulation⁹. This article focuses on the methods used in diagnosing and treating BBD. Considering the comfort and quality of life of children, rehabilitation methods that are useful in patients with such a common health problem can be used to shorten the treatment period, reduce the duration of medical treatment, and help patients get faster results.

Materials and Methods

This study was conducted by retrospectively examining pediatric patients aged 5-18 years who were followed up in the Pediatric Nephrology and Urology clinics between 2022 and 2025, and who were diagnosed with bladder-bowel dysfunction. The approval was taken from Non-invasive Clinical Research Ethics Committee (approval number: 2243). Patients with a BBDSS of 13 and above were included in the study. Patients with known neurological disorders were excluded from the study. After obtaining approval from the local ethics committee, the following information was collected from patient files: age, age at presentation, complaints, presence of constipation and urinary incontinence, BBDSS, accompanying urological and nephrological anomalies, presence of infection, results of uroflowmetric evaluations, medications used, and rehabilitation methods applied during treatment.

Statistical Analyses

Descriptive statistics were used to summarize demographic data, clinical characteristics, and treatment outcomes. Continuous variables such as age and BBDSS were expressed as means with ranges or standard deviations, where appropriate. Categorical variables, including treatment modalities, presence of vesicoureteral reflux (VUR), recurrent urinary tract infections (UTIs), and relapse rates, were reported as counts and percentages. Patients were stratified into subgroups based on initial BBDSS levels, uroflowmetry findings, and response to first-line treatments. Treatment responses were assessed at predefined intervals (2, 6, and 9 months), and clinical improvement was defined as a reduction in BBDSS to below 13 and absence of symptom relapse. No inferential statistical tests (e.g., t-tests, chi-square tests) were applied, as the primary objective was to describe treatment patterns and outcomes rather than to compare intervention efficacy statistically.

Results

A total of 1846 children diagnosed with BBD were included in the study. The mean age of the participants was 104.4 months (range: 60–212.4 months). At the time of admission, the mean BBDSS was 13.5 ± 4.2 among patients who responded to conservative therapy alone (Table 1).

Among the study population, 512 patients (74% male) received only osmotic-laxative and urotherapy for 3 months. All presented with urinary incontinence, and none had VUR or recurrent UTIs. This group had comparatively lower BBDSS values and exhibited no relapses during the initial 6-month follow-up (Table 2).

The remaining 1334 patients had more complex clinical presentations. 213 patients had recurrent UTIs, and 38 of them also had VUR. Clinical presentation in all of these patients was consistent with either overactive bladder (OAB) or urinary incontinence.

Of the 412 patients diagnosed with OAB, 267 were treated with oxybutynin and 145 with propiverine, both in combination with osmotic-laxative therapy. Similarly, 922 patients presented with urinary incontinence but without OAB. Among them, 756 had BBDSS <20 and were treated with oxybutynin ($n=542$) or propiverine ($n=214$) in combination with osmotic-laxative. None of these subgroups exhibited relapse during the first 6 months of treatment. A subgroup of 166 patients with BBDSS >20 was further analyzed. Among them, 34 patients exhibited pathological findings on uroflowmetry and were started on biofeedback therapy (10 sessions) in addition to propiverine and osmotic-laxative. The remaining 132 patients were treated with either oxybutynin ($n=87$) or propiverine ($n=45$) plus osmotic-laxative. At the end of the second month, all patients in this subgroup showed less than 50% clinical improvement.

As a result, biofeedback therapy (8 sessions) combined with propiverine and osmotic-laxative was initiated for all 166 patients. At the end of this intervention, all patients had BBDSS <13 and showed no relapses during the initial 6-month follow-up (Table 3).

Among the 34 patients with initial uroflowmetry abnormalities, 19 responded to the 10-session biofeedback protocol. The remaining 17 required 10 additional biofeedback sessions, resulting in a 9-month treatment course. Of these, 6 patients still had persistent symptoms and were treated with transcutaneous electrical nerve stimulation (TENS) for an additional 4 months. All but one patient responded favourably to this combined treatment regimen.

Discussion

This study presents one of the most comprehensive clinical evaluations of BBD in children, involving a large cohort of 1846 patients and a detailed stratification based on symptom severity and treatment response. A major strength lies in the structured stepwise approach to therapy—ranging from conservative management to pharmacological and behavioural interventions such as biofeedback and TENS—which was tailored to each patient's clinical status and symptom burden.

In our study, the female gender was more predominant among children diagnosed with BBD. This finding is consistent with previous reports indicating a higher prevalence of BBD among girls compared to boys¹⁰.

Anatomical, hormonal, and behavioural factors have been proposed to explain this gender disparity. The higher proportion of female patients in our cohort supports the notion that girls may be at greater risk for both functional lower urinary tract symptoms and constipation, emphasizing the need for gender-specific preventive strategies. The global burden of chronic kidney disease (CKD) in children has been increasing, and voiding dysfunctions, particularly those associated with BBD, have been recognized as one of the most frequent and preventable contributors¹¹. Past UTIs and untreated dysfunctional voiding during childhood not only increase the risk of CKD in later life but are also associated with increased morbidity and mortality, as well as long-term economic burdens on healthcare systems¹². Consequently, early diagnosis and appropriate treatment strategies should aim not only to reduce medical complications but also to decrease public health costs in the long run.

Among the modifiable risk factors, constipation is of particular clinical importance. Remarkably, resolution of constipation alone can lead to significant improvement—or even complete resolution—of urinary symptoms in many children¹³. Recurrent UTIs are often exacerbated by underlying constipation, which is strongly associated with poor dietary habits and a sedentary lifestyle¹⁴. Therefore, addressing nutrition and physical inactivity should be integral parts of any treatment plan. Promoting adequate hydration, a fibre-rich diet, and regular physical activity can improve both bowel and bladder health and reduce the reliance on pharmacologic interventions.

In this study, children without VUR or recurrent UTIs who were treated with osmotic laxatives and urotherapy showed no relapse during the first six months. This aligns with previous findings suggesting that non-invasive strategies are effective in early-stage BBD². Importantly, for patients with VUR and recurrent UTIs, long-term urotherapy—including timed voiding, morning and bedtime urination, generous hydration, and avoiding holding behaviour—should not be limited to short-term treatment but must be integrated into the patient's daily life as a preventive lifestyle modification. Sustained adherence to these routines significantly reduces disease recurrence and progression¹⁵.

In patients with more severe symptoms (BBDSS >20), especially those with pathological uroflowmetry, biofeedback therapy was highly effective. However, nearly half of this subgroup required extended therapy durations or adjunctive TENS for optimal clinical improvement. This observation highlights the importance of individualized treatment timelines, which are often underemphasized in the literature¹⁶.

Furthermore, the combination of antimuscarinic agents (oxybutynin or propiverine) with osmotic laxatives yielded consistent remission across all non-OAB incontinence subgroups. These results underscore the advantage of addressing both bowel and bladder dysfunction concurrently—a strategy supported by multiple studies^{15,17}.

The most notable outcome of this study is the absence of relapse across all treatment groups during the six-month follow-up period. This supports the reliability of the BBDSS scoring system in stratifying disease severity and guiding targeted therapy. Moreover, it reinforces the role of early, structured, and individualized management in preventing long-term renal complications and reducing the societal and financial burden associated with untreated BBD.

Lastly, it is essential to rule out underlying urological anomalies before initiating standard BBD protocols. Anatomic abnormalities may mimic or compound symptoms and, if overlooked, may result in persistent symptoms or progression to renal impairment¹³.

Conclusion

In conclusion, this study proposes a robust and adaptable treatment framework for pediatric BBD. Future research should focus on prospective validation of this hierarchical approach, as well as long-term monitoring of renal

outcomes and cost-effectiveness. Particular attention should be given to behavioural interventions, early diagnosis of constipation, and lifestyle modifications, which remain central to both the treatment and prevention of BBD.

Ethics

Ethics Committee Approval: A retrospective study was conducted in institute after the approval of the İzmir Bakırçay University, Non-invasive Clinical Research Ethics Committee (approval number: 2243).

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

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