Prevalence of Bladder and Bowel Dysfunction in the Outpatient Clinic of Pediatric Urology and Nephrology

Prevalencia de la disfunción de la vejiga y del intestino en la consulta ambulatoria de urología y nefrología pediátrica

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Abstract

Objective Bladder and bowel dysfunction (BBD) is defined as the presence of functional alterations in both organs. The correct diagnosis and treatment prevent the exposure of patients to multiple antibiotic treatments, invasive procedures and radiological studies. The aim of the present study was to estimate the prevalence of BBD in the outpatient clinic of pediatric urology and nephrology.

Methods A prospective cohort composed of 334 patients aged between 5 and 18 years was evaluated. The Pediatric Lower Urinary Tract Symptom Score (PLUTSS) was applied. A score higher than 8 was considered as significant urinary symptomatology. Moreover, the Bristol Stool Scale and the Rome IV Criteria for functional constipation and fecal incontinence were used. Patients with organic pathologies were excluded. The risk factors were evaluated using logistic regression models.

Results The median age was 9 years old (interquartile range [IQR]: 6–13). The PLUTSS questionnaire was significant in 16.5% of the kids, constipation was found in 31.9%, and fecal incontinence, in 4%. The prevalence of BBD was of 27.8%. The female gender (odds ratio [OR]: 2.47; $p = 0.002$) and psychological disorders (OR: 4.637; $p = 0.024$) were considered risk factors. The evaluation of the PLUTSS questionnaire showed relevance regarding incontinence (OR: 3.059; $p = 0.038$), enuresis (OR: 8.532; $p < 0.001$); intermittent flow (OR: 9.211; $p = 0.004$), frequency (OR: 6.73; $p = 0.005$), and constipation (OR: 34.46; $p < 0.001$).

Conclusions The prevalence of BBD is of 27.8% in the outpatient clinic. It is important to prevent associated complications and the exposure to multiple antibiotic treatments, as well as invasive and imaging procedures, which also generate high costs to the health system.

Keywords
- bladder and bowel dysfunction
- constipation
- lower-urinary-tract symptoms
- pediatric urology
- pediatric nephrology
- prevalence

Resumen

Objetivo El síndrome de disfunción de la vejiga y del intestino (DVI) se define como la presencia de alteraciones funcionales en ambos órganos. El correcto diagnóstico y

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tratamiento previene la exposición de los pacientes a múltiples manejos antibióticos, procedimientos invasivos y estudios radiológicos. El objetivo de este estudio es estimar la prevalencia de DVI en la consulta ambulatoria de urología y nefrología pediátrica.

Métodos Se evaluó una cohorte prospectiva de 334 pacientes de 5 a 18 años. Se aplicó el cuestionario de Puntuación de Síntomas del Tracto Urinario Inferior (Pediatric Lower Urinary Tract Symptom Score, PLUTSS), cuyo resultado mayor a 8 fue considerado significativo. Adicionalmente, se usó la Escala de Heces de Bristol (Bristol Stool Scale) y los Criterios Roma IV (Rome IV Criteria) para estreñimiento e incontinencia fecal. Los factores de riesgo se evaluaron bajo modelos de regresión logística.

Resultados La edad mediana fue de 9 años (rango intercuartil [RIC]: 6–13). El cuestionario PLUTSS fue significativo en 16,5% de los niños, y se observó estreñimiento en 31,9%, e incontinencia fecal en 4%. La prevalencia de DVI fue de 27,8%. El sexo femenino (razón de probabilidades [RP]: 2.47; $p = 0.002$) y desordenes psicológicos (RP: 4.637; $p = 0.024$) fueron considerados factores de riesgo. La evaluación del cuestionario PLUTSS mostró relevancia en incontinencia (RP: 3.059; $p = 0.038$), enuresis (RP: 8.532; $p < 0.001$), flujo intermitente (RP: 9.211; $p = 0.004$), frecuencia (RP: 6.73; $p = 0.005$), y estreñimiento (RP: 34.46; $p < 0.001$).

Conclusiones La prevalencia de DVI fue de 27.8% en la consulta ambulatoria. Es importante prevenir complicaciones asociadas y la exposición a múltiples tratamientos antibióticos, procedimientos invasivos e imagenológicos, que adicionalmente generan altos costos al sistema de salud.

Palabras clave
- disfunción de la vejiga y del intestino
- estreñimiento
- síntomas del tracto urinario inferior
- urología pediátrica
- nefrología pediátrica
- prevalencia

Introduction

The International Children's Continence Society (ICCS) defines bladder and bowel dysfunction (BBD) as the presence of functional alterations in these organs in children older than 5 years of age.[1,2] It occurs due to the anatomical contiguity and the shared irrigation and innervation of the bladder and the bowel: dysfunction in one organ affects the function of the other.[3,4] The symptoms include urinary incontinence, enuresis, nocturia and increased or decreased urinary frequency, constipation and encopresis.[3,5]

The presence of lower-urinary-tract symptoms (LUTSs) is a frequent reason for consultation in the pediatric urology and nephrology clinic, representing up to 40% of the cases.[4] Worldwide, the prevalence of urinary incontinence is between 6.3% and 9% at the age of 7 years, decreasing to between 1.2% and 3% in teenagers.[4] Likewise, constipation in the pediatric population has a prevalence of $\sim$ 0.3% to 8%[4] and of $\sim$ 4.2% to 32% when associated to voiding dysfunction.[6–8] However, these data are variable and inconclusive. The complications include vesicoureteral reflux, urinary-tract infections (UTIs), abdominal pain, and emotional and behavioral disorders.[4,5,9]

The diagnosis of BBD is based on the clinical history focused on habits and voiding and bowel technique, as well as the documentation of the voiding diary and, in some cases, the measurement of the postvoid residual (PVR) volume, uroflowmetry with electromyography, and videourodynamic study.[6,10,11] The physical examination should be aimed at ruling out pathologies such as obstruction of the lower urinary tract or neurological disorders.[10,11] The treatment is based on the management of intestinal symptoms, improving the LUTSs.[10,11]

The aim of the present study is to estimate the prevalence of BBD in the outpatient clinic of pediatric urology and nephrology.

Methods

A prospective cohort composed of 334 patients aged between 5 and 18 years who attended the outpatient clinic of pediatric urology and nephrology was prospectively evaluated between April 4th, 2018 and April 3rd, 2019. The sample included all kids that attended the outpatient clinic during this period. The study protocol was approved by the Institutional Ethics Committee at Hospital Universitario Fundación Santa Fe de Bogotá, Bogotá, DC, Colombia, under the tenets of the Declaration of Helsinki. Before the consultation, an informed consent form was signed by the parents or legal guardians of the kids. Kids older than 7 years of age were asked for assessment.

All patients were evaluated for medical history, including gender, age, height and weight, history of prematurity, history of neurological, psychological, urological and nephrological disorders, history of UTI admission, and history of enuresis in the parents. A total of 86 patients with past history of myelomeningocele, spina bifida, refractory epilepsy, lysosomal storage diseases, Down syndrome, nephrectomy, urothelial carcinoma, hypospadias, vesicoureteral reflux and acute and chronic kidney injury were excluded.

During the consultation, the caregivers and the patients filled the version of the Pediatric Lower Urinary Tract Symptom Score (PLUTSS) translated into Spanish and validated by Somoza-Argibay et al,[12] and the Bristol Stool Scale to assess the patients with constipation.

The PLUTSS questionnaire contains 15 questions that evaluate enuresis and incontinence, the subjective quantity of urine lost during the day and night, the LUTSs (storage and voiding), the habits to hold urination, the daily deposition, and the quality of life (QoL). A score higher than 8 was considered significant for LUTSs.

If needed, the patients were ruled out for UTIs with urinalysis and urine culture, and had their PVR volume evaluated by abdominal ultrasound, the uroflowmetry by electromyography, and a urodynamic study was also performed. The diagnosis of BBD was made after significant LUTSs measured by PLUTSS, history of UTI or PVR volume higher than 10% of the total bladder capacity, and constipation were observed.

The database was recorded using the Microsoft Excel for Mac (Microsoft Excel for MacOS, 2016, Microsoft Corp., Redmond, WA, US). The statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS for MacOS, IBM Corp., Armonk, NY, US) software, version 25.0. The first analysis included all patients ($n = 334$) for evaluation of the medical history and exclusion criteria. The qualitative data were evaluated as frequencies, and the quantitative data were tested for normality using the Kolmogorov-Smirnoff test. If the data had normal distribution, they were reported as mean ± standard deviation; otherwise, they were reported as median (interquartile range, IQR).

Out of de 334 patients surveyed, 86 did not meet the inclusion criteria. The remaining 248 patients were included in the second analysis. The data were described and then stratified by type of consultation (pediatric urology versus pediatric nephrology), and by diagnosis of BBD. All of the qualitative variables were compared using the Chi-squared test. The parametric quantitative data were compared using the Student *t*-test for independent samples, and the Mann-Whitney U test for the non-parametric variables.

Univariate and multivariate analyses were performed to determine the risk factors for BBD. The variables included relevant medical history (gender, history of prematurity, neurological and psychological disorders, urinary tract malformation, hydronephrosis and enuresis in the parents) and every question of the PLUTSS questionnaire. In the analyses, p-values < 0.05 were considered significant.

Results

The median age of the patients who attended the outpatient clinic was 9 years-old (IQR: 6–13), and median body surface area was 0.103 m^2 (IQR: 0.085–0.143). In total, the sample was composed of 174 (52.1%) male patients and 160 (47.9%) female patients. Regarding the medical history, prematurity was found in 174 (52.1%) patients, neurologic disorders, in 28 (8.4%), psychological disorders, in 13 (5.9%), previous abdominal surgery, in 39 (11.7%), intestinal disorders, in 3 (0.9%), UTIs, in 103 (30.8%), hydronephrosis, in 20 (6%), anatomical malformation, in 22 (6.6%), and kidney transplantation, in 7 (2.1%) patients. A total of 86 (25.7%) patients were excluded. The overall data can be found in ►**Table 1**.

Table 1 Characteristics of the patients who attended the clinic

Variables	*n = 334*
Age (years) ‡	9 (6–13)
Gender ⌽	
Female	160 (47.9)
Male	174 (52.1)
Body surface area (m^2) ‡	0.103 (0.085–0.143)
Weeks of gestation at birth ‡	39 (36–40)
History of prematurity ⌽	62 (29.5)
Neurological disorders ⌽	
Myelomeningocele	7 (2.1)
Hypotonia	1 (0.3)
Down syndrome	1 (0.3)
Arteriovenous malformation	1 (0.3)
Spina bifida	2 (0.6)
Epilepsy	10 (3)
Neurofibromatosis	3 (0.9)
Brain tumor	1 (0.3)
Lysosomal storage disease	1 (0.3)
Asperger syndrome	1 (0.3)
Psychological disorders ⌽	
Attention deficit hyperactivity disorder	6 (1.8)
Traumatic event in the past	3 (0.9)
Anxiety and obsessive-compulsive disorder	2 (0.6)
History of urinary-tract infection ⌽	103 (30.8)
One episode	46 (14.7)
Two or more episodes	34 (10.7)
History of hydronephrosis ⌽	20 (6)
History of urinary malformation ⌽	22 (6.6)
History of vesicoureteral reflux ⌽	34 (10.2)
Enuresis in the parents ⌽	
Father	1 (0.3)
Mother	2 (0.6)
Excluded patients ⌽	86 (25.7)

Notes: ⌽ Reported as n (%). ‡ Reported as median (interquartile range).

When compared by type of consultation (pediatric urology versus pediatric nephrology), there were more males in the urology group (90.6% versus 44%;. $p < 0.001$). The week of gestation at birth was higher for the nephrology group (36.5 [IQR: 35–39] versus 40 [IQR: 36–40]; $p = 0.005$); however, there were no differences regarding the history of prematurity. Moreover, the history of psychological disorders (12.5 versus 0%; $p < 0.001$), abdominal surgery (17.2 versus 3.3; $p = 0.001$) and enuresis in the kid's parents (3.1 versus 0.5%; $p = 0.047$) were higher in the urology group, while the history of UTIs was lower (14.1 versus 32.6%; $p = 0.004$).

During the consultation, more patients in the nephrology group needed abdominal ultrasound (18.8 versus 44.6%; $p < 0.001$); however, less patients had a significant PVR volume (18.8 versus 6.5%; $p = 0.004$). As for the PLUTSS questionnaire, the diagnosis of constipation or fecal incontinence, and the diagnosis of BBD, there were no differences between the groups. The overall prevalence of BBD was of 27.8%. The prevalence in the pediatric urology clinic was of 26.6%, and in the pediatric nephrology clinic it was of 28.3%. All data stratified by type of consultation are in ►**Table 2**.

The children with diagnosis of BBD were younger (7 years [IQR: 5–8] versus 11 years [IQR: 7–14]; $p < 0.001$). Additionally, BBD was more frequent in females (37.6 versus 20.1%; $p = 0.002$) (►**Table 3**). There were no differences between the groups regarding past medical history.

In the univariate analysis, we found that being female (odds ratio [OR]: 2.47 [95% confidence interval (95%CI: 1.389–4.4)]; $p = 0.002$) and having psychological disorders (OR: 4.637 [95% CI: 1.224–17.558]; $p = 0.024$) like trauma, obsessive-compulsive disorder (OCD), anxiety and attention deficit hyperactivity disorder (ADHD) were a risk factors for BBD.

Moreover, the analysis of the questionnaire showed as risk factors incontinence (question 2; OR: 3.059 [95%CI: 1.067–8.776]; $p = 0.038$), enuresis (question 3; OR: 8.532 [95%CI: 2.7–26.96]; $p < 0.001$), intermittent flow (question 8; OR: 9.211 [2.011–42.196]; $p = 0.004$), frequency (question 9; OR: 6.73 [95%CI: 1.788–25.33]; $p = 0.005$) and constipation (question 13; OR: 34.46 [95%CI: 13.393–88.666]; $p < 0.001$). The summary of the regression analysis of the risk factors for BBD is in ►**Table 4**.

Discussion

The true incidence of BBD is unknown,[13] and the prevalence is inconclusive due to the lack of studies on the subject. Burgers et al[14] studied BBD in a cohort of 113 patients who attended the pediatric urology clinic due to LUTSs, and they found a prevalence of 47%. Vaz et al,[15] in a population of 739 schoolchildren, found a prevalence of symptoms of lower-urinary-tract dysfunction in 21.8% of the cases, and of constipation in 30.7%. In the present study, the prevalence of BBD in the pediatric urology consultation was of 26.6%; in the pediatric nephrology consultation, it was of 28.3%; and the overall prevalence was of 27.8%. These differences can be attributed to the different inclusion criteria of each study. We included all patients who attended the clinic, and only excluded kids with pathologies that could explain the LUTSs, the history of UTI, or the constipation.

In the present study, there were more male patients; however, the prevalence of BBD was higher in the female population (41 (59.4%) cases versus 28 (40.6%) cases; $p = 0.002$). Moreover, being of the female gender increased the risk of developing BBD, with a ratio of 2.5:1 in relation to the male gender. In the study by Vaz et al,[15] the authors found an association of lower-urinary-tract dysfunction and the female gender, with an OR: of 3.7 (95%CI: 2.5–5.7; $p < 0.001$). It is hypothesized that in women there are inappropriate activities of the pelvic floor muscles and/or the urethral sphincter during voiding, causing functional bladder outlet obstruction (BOO).[16]

The relevant medical history showed no differences between the populations with or without BBD; however, when the categories were stratified by the presence or not of the corresponding disorder, the psychological history increased the chance of developing BBD, with a ratio of 4.6:1 patient. The psychological diagnosis included trauma, OCD, anxiety and ADHD. Yang et al[17] evaluated 130 patients in the pediatric urology clinic and stratified the results by ADHD diagnosis. They stated that kids with ADHD presented more soaked underwear and urgency.[17] Additionally, Arlen et al[18] presented 25 patients with phantom urinary incontinence and concomitant LUTSs and constipation, and 70% of the kids had a diagnosis of OCD. And in a comparison of 38 kids with LUTSs versus 38 kids without LUTSs, Zhao et al[19] found an anxiety level score higher in the group with LUTSs (3.68 versus 0.97; $p < 0.001$).

On the other hand, the PLUTSS questionnaire showed a significant association between LUTSs and BBD when the score was higher than 8 points.[12] When evaluating the association of each question with the diagnosis of BBD, the risk was 3.06 times higher for incontinence, 8.53 times higher for enuresis, 9.21 times higher for intermittent flow, 6.73 times higher for frequency, and 34.46 times higher for constipation. We believe that reducing the PLUTSS questionnaire to only these five questions would speed up the consultation without resulting in the underdiagnosis of the patients with LUTSs.

Once the patient is diagnosed with BBD and other diagnosis are ruled out, it is important to focus the treatment in the urinary and bowel symptomatology at the same time. The constipation should be assessed and managed with a high amount of fluids and increased ingestion of dietary fiber, as well as stool softeners[20] concomitant with behavioral recommendations for micturition. Polyethylene glycol (PEG) is the most commonly used stool softener, and it should be administer to all patients with LUTSs.[20] In cases of recurrent UTIs, the antibacterial prophylaxis can be prescribed,[21,22] specifically for the patients with vesicoureteral reflux and changes in the renal cortex.[23] The misconception regarding antibiotic prophylaxis might increase bacterial resistance. Toska and Geitona[24] evaluated 301 doctors and nurses about the prescription of antibiotics in the pediatric population, and found irrational prescribing in 56% of the cases due to uncertainty regarding the diagnosis. Thus, the right diagnosis and evaluation, as well as the management with dietary and behavioral changes, are important to avoid the prescription of prophylactic or therapeutic antibiotics due to the complications of an undermanaged BBD.

Pediatric patients are up to 10 times more sensible to radiation than adults.[25] This vulnerability leads physicians to try to reduce the number of imaging procedures performed on them. In case the patient with BBD is resistant to therapy or a functional or anatomical dysfunction is suspected, the images must be taken according to the as low as reasonably achievable (ALARA) protocol.[25,26] In our cohort, 50% of the patients needed imaging evaluations, and they were first submitted to ultrasonography. Only 9.7% of the kids presented

Table 2 Evaluation of the included patients stratified by type of consultation

	Pediatric urology	Pediatric nephrology	*p-value*
Variables	***n* = 64**	***n* = 184**	
Relevant medical history			
Age (years) ‡	9 (6–14)	9 (6.75–13)	0.988
Gender ◐			< 0.001
Female	6 (9.4)	103 (56)	
Male	58 (90.6)	81 (44)	
Body surface area (m^2) ‡	0.107 (0.083–0.149)	0.102 (0.086–0.142)	0.803
Weeks of gestation at birth ‡	36.5 (35–39)	40 (36–40)	0.005
History of prematurity ◐	16 (37.2)	32 (26.4)	0.183
Neurological disorders ◐	6 (9.4)	7 (3.8)	0.192
Psychological disorders ◐	8 (12.5)	0 (0)	< 0.001
History of UTI ◐	9 (14.1)	60 (32.6)	0.004
One episode	4 (6.3)	30 (17.5)	0.245
Two or more episodes	5 (7.8)	17 (9.3)	
History of hydronephrosis ◐	5 (7.8)	11 (6)	0.288
History of urinary malformation ◐	0 (0)	15 (8.2)	0.593
Enuresis in the parents ◐	2 (3.1)	1 (0.5)	0.047
Evaluation of BBD			
PLUTSS score ‡	1 (0–5.75)	0 (0–4.75)	0.234
Incontinence ◐	12 (18.7)	32 (17.4)	0.875
Enuresis ◐	11 (17.2)	23 (12.5)	0.695
Frequency ◐	7 (11.9)	21 (11.4)	0.700
Voiding symptoms ◐	20 (7.8)	40 (5.43)	0.128
Urgency ◐	12 (9.38)	39 (10.59)	0.640
Hold urination ◐	14 (21.9)	35 (19)	0.621
Daily deposition ◐	47 (73.4)	141 (76.6)	0.607
Affected quality of life ◐	6 (9.4)	15 (8.1)	0.437
Diagnosis of significant LUTS ◐	10 (15.6)	31 (16.8)	0.821
Bristol Stool Scale ◐			0.014
1	1 (2.1)	22 (19.3)	
2	7 (14.6)	24 (21.1)	
3	15 (31.3)	25 (21.9)	
4	25 (52.1)	43 (37.7)	
Diagnosis of constipation ◐	18 (28.1)	61 (33.2)	0.457
Encopresis ◐	2 (3.1)	8 (4.3)	0.668
Additional laboratories or imaging studies			
Infectious urinalysis ◐	2 (11.8)	12 (9.3)	0.746
Positive urine culture ◐	3 (33.3)	12 (27.9)	0.134
PVR volume (mL) ‡	9.5 (2–14.75)	8.5 (0.975–8.5)	0.920
Significant PVR ◐	12 (18.8)	12 (6.5)	0.004
Diagnosis of BBD			
Global prevalence ◐	69 (27.8)		
Stratified prevalence ◐	17 (26.6)	52 (28.3)	0.794

Abbreviations: BBD, bladder and bowel dysfunction; LUTS, lower-urinary-tract symptoms; PLUTSS, Pediatric Lower Urinary Tract Symptom Score; PVR, postvoid residual; UTI, urinary-tract infection.
Notes: ◐ Reported as n (%). ‡ Reported as median (interquartile range).

Table 3 Characteristics of the patients stratified by diagnosis of bladder and bowel dysfunction

Variables	Patient with bladder and bowel dysfunction	Healthy patient	*p-value*
	n = 69	*n = 179*	
Age (years) ‡	11 (7–14)	7 (5–8)	< 0.001
Gender ⦶			0.002
Female	41 (59.4)	68 (38)	
Male	28 (40.6)	111 (62)	
Body surface area (m^2) ‡	0.120 (0.089–0.153)	0.092 (0.075–0.102)	< 0.001
Weeks of gestation at birth ‡	39.5 (36–40)	38 (35.75–40)	0.182
History of prematurity ⦶	16 (34.8)	32 (27.1)	0.333
Neurological disorders ⦶	4 (5.8)	9 (5)	0.636
Psychological disorders ⦶	6 (8.7)	4 (2.2)	0.100
History of hydronephrosis ⦶	4 (5.8)	12 (6.7)	0.746
History of urinary malformation ⦶	13 (7.3)	2 (2.9)	0.939
Enuresis in parents ⦶	1 (1.4)	2 (1.2)	0.645

Notes: ⦶ Reported as n (%). ‡ Reported as median (interquartile range).

Table 4 Regression analysis of the various risk factors for bladder and bowel dysfunction

Variables	Univariate analysis*		Multivariate analysis**	
	OR (95% CI	*p-value*	Adjusted OR (95%CI)	*p-value*
Baseline characteristics				
Gender (female)	2.39 (1.355–4.216)	0.002	2.472 (1.389–4.4)	0.002
History of prematurity	1.433 (0.691–2.974)	0.333	1	N/A
Neurological disorders	1.162 (0.349–3.906)	0.808	1	N/A
Psychological disorders	4.167 (1.138–15.251)	0.020	4.637 (1.224–17.558)	0.024
History of hydronephrosis	0.856 (0.267–2.752)	0.794	1	N/A
History of urinary malformation	0.381 (0.084–1.735)	0.196	1	N/A
Enuresis in the parents	1.301 (0.116–14.588)	0.830	1	N/A
Questionnaire				
Incontinence	9.066 (4.395–18.701)	< 0.001	1	N/A
Quantitative incontinence	10.09 (4.737–21.489)	< 0.001	3.059 (1.067–8.776)	0.038
Enuresis	5.587 (2.606–11.977)	< 0.001	8.532 (2.7–26.96)	< 0.001
Quantitative enuresis	5.587 (2.606–11.977)	< 0.001	1	N/A
Polaquiuria	3 (1.346–6.685)	0.005	1	N/A
Straining	4.94 (1.398–17.452)	0.007	1	N/A
Voiding pain	3.418 (0.89–13.127)	0.059	1	N/A
Intermittent flow	6.6 (2.201–19.79)	< 0.001	9.211 (2.011–42.196)	0.004
Frequency	10.176 (3.837–26.987)	< 0.001	6.73 (1.788–25.33)	0.005
Urgency	7.178 (3.057–16.852)	< 0.001	1	N/A
Holding	6.478 (3.305–12.695)	< 0.001	1	N/A
Wetting	5.938 (2.388–14.765)	< 0.001	1	N/A
Constipation	20.5 (9.933–42.307)	< 0.001	34.46 (13.393–88.666)	< 0.001

Abbreviations:95%CI, 95% confidence interval; N/A, not available; OR, odds ratio.
Notes: *Chi-squared test. **Logistic regression.

positive findings for high PVR volume, but we did not find patients with urological malformations.

The Center for Child Incontinence at the Aarhus University Hospital, in Denmark, has a multidisciplinary team (pediatric nephrology, urology, urotherapy, psychology, sleep disorders, genetics and constipation) that treats children with nocturnal enuresis, overactive bladder and BBD.[27] In a study[27] with 400 patients, they concluded that most of them could be treated in primary care, and that the specialized clinics should assess therapy-resistant patients and kids with underlying pathologies. The creation of an specialized clinic on BBD in our hospital would help us improve and speed up the diagnosis of BBD and the beginning of the non-antibacterial non-pharmacological management of the patients. Moreover, a multidisciplinary team involving pediatric gastroenterology, urotherapy and nursing under a protocol of recurrent UTIs or therapy-resistant BBD management might prioritize patients, reducing complications and the rate of admissions to the inpatient care facility, as well as the need for imaging or invasive procedures and antibacterial therapy, thus reducing the costs to the healthcare system.

The limitations of the present study include the missing data regarding the PVR volume, the urinalysis and the urine culture in some patients. However, we believe that assessing the prevalence in the pediatric urology and nephrology clinic would help physicians to prevent complications, hospitalizations, the management with antibiotics and invasive or imaging procedures.

Conclusion

The prevalence of BBD is of 27.8% in our outpatient clinic. Adequate evaluation, diagnosis and management are important to prevent the associated complications and the exposure to multiple antibiotic treatments and invasive and imaging procedures. With the creation of a standardized transdisciplinary BBD clinic, physicians would assess the patients easily and better, thus decreasing the costs to the healthcare system.

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Conflict of interests

The authors have no conflict of interests to declare.

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