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Psychosocial and respiratory disease related to severe bladder dysfunction and non-monosymptomatic enuresis

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Summary

Objective
Complicated bladder dysfunctions (BD) (associated with infections/urological complications or irresponsive to treatment) are a small proportion of all cases, but are highly morbid, clinically and psychosocially. Our aim is to describe a cohort of complicated pediatric BD, using subgroup analysis to compare presentations and responses to treatment among genders, age groups, and patients with or without non-monosymptomatic enuresis (NME). We also relate severe BD to other health conditions or to social/behavioral problems and report treatment results.

Method
Thirty-five cases of complicated BD were reviewed. Neurogenic bladders and anatomical urological problems were excluded. Justifications for referral, comorbidities, and social aspects/familial dynamics were studied. Overactive bladders were primarily treated with oxybutynin. Transcutaneous parasacral neuromodulation was used in case of insufficient response or unbearable side effects. For infrequent voiders, timed voiding and transcutaneous neuromodulation were counseled.

Results
Incontinence/enuresis were the motives for referral in only a third of the cases. UTI (42.9%) was the main reason for referral. Hydronephrosis was observed in 8.6% of the children. Respiratory/ENT problems, obesity, and precocious puberty were highly prevalent. Schooling problems and neuropsychiatric disease were common. Social problems were common. Five patients presented urological problems secondary to BD (hydroureteronephrosis, VUR, trabeculated bladder). Twenty percent of cases required high anticholinergic doses and 37.1% transcutaneous electrostimulation. Eight (22.9%) patients abandoned but later resumed therapy, and 14.6% did not follow treatment. Boys tended to be older than girls and presented NME, respiratory, and behavioral problems more often, with a significant difference for asthma and anxiety/depression. Associated health problems and neuropsychiatric treatment tended to be more frequent among those presenting NME. Non-enuretic children tended to show better results from treatment (see Table).

Conclusion
The social characteristics of our population (severe cases, socially deprived, very poor, not well educated, and with limited access to health care) determine a very specific sampling. Our research demonstrated that even severe cases of BD affecting socially deprived children may be treated, with adhesion to treatment and results comparable with other cohorts of BD, although the children need multidisciplinary attention and close follow-up. Boys, older children, and NME are more difficult to treat and often have other associated health and behavioral problems. Stress-related conditions were common in severe BD. A relatively high occurrence of precocious puberty was an unexpected finding in our research.

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Table

	Data	Significant
General information	11 males:24 females, mean follow-up 20.6 months, mean age 8.1 years	—
Respiratory/ENT problems	Any/Asthma/Symptomatic adenoid hypertrophy/Mouth breathing/ Dysacusia (8.6%)	Asthma, males predominance, $p = 0.0058$
Neuropsychiatric problems/ treatment	Anxiety/depression/Recurring headaches/migraine/Functional abdominal pain, symptomatic esophageal reflux/Hyperactivity disorder, extreme agitation/ Autism/Epilepsy/Corpus callosum agenesis	Anxiety/depression, males predominance, $p = 0.0071$, neuropsychiatric active treatment, males predominance, $p = 0.0413$
Social problems	Dysfunctional families/Non-parental custody/Violence/child abuse/ Aggressiveness	—
Urological symptoms	UTI/Infrequent voider/High frequency/Urge syndrome/ Enuresis/Nocturia/Hematuria/ Priapism/Vulvovaginitis	Enuresis, mouth breathers predominance, $p = 0.0171$, enuresis, absent for infrequent voiders, $p = 0.0462$

Introduction

Lower urinary tract symptoms (LUTS) are extremely common among children, with a large predominance of overactive bladders. Most are not associated with infections or other urological problems (non-complicated BD) and are easily treated. However, a subset may present associated problems or complications (especially urinary tract infections — UTI, vesicoureteral reflux — VUR, and hydronephrosis) or show an inadequate response to treatment, and these are referred to pediatric urologists for further treatment.

Our aim in this research is to describe a cohort of children presenting complicated or irresponsive bladder dysfunction (BD) that were referred to a tertiary specialized pediatric urology clinic for treatment. We hypothesized that complicated BD is epidemiologically related to behavioral problems, respiratory disease, and obesity, and demands more intensive treatment.

Methods

The charts of patients being treated in our pediatric urology referral clinic from 2011 to 2014 presenting complicated BD were retrospectively analyzed. Complicated cases of BD, herein defined as BD associated with multiple episodes of febrile UTI, secondary functional hydronephrosis (not related to mechanical obstructions), and/or irresponsive/ persistent BD after $>$ 3 months pharmacological treatment are sent to our referral pediatric urology clinic. Non-complicated BD cases, presenting LUTS symptoms without other urological problems are treated by the pediatricians and/or pediatric nephrologists. Subgroup analysis was performed comparing genders (female versus male children), ages ($\leq$5 years versus $>$ 5 years), and NME versus non-enuretic cases (restricted to the $>$5 years age group). We also studied the main reason to send the patient to the specialized clinic, associated morbidities (respiratory problems, psychoneurologic problems, obesity, other), and social aspects/familial dynamics.

Patients with suspicion of spinal cord problems or neurogenic bladder, adults ($>$18 years) and cases of BD secondary to primary anatomical urologic disease were excluded.

As a routine, all cases of BD were submitted to an ultrasound evaluation of the kidneys and urinary tract with measurement of post-voiding residuals and bladder wall thickness. Children and parents were educated about BD symptoms, causes, and treatment by the urologist during consultation and were instructed to maintain adequate hydration and to urinate at least each 4 h and before bedtime. Correct postures for micturition and evacuation were also taught. An adequate diet to avoid constipation was counseled. Compliance with behavioral orientations was checked in each follow-up clinical evaluation.

Definitions and management of diagnostic tests followed the recommendations of the standardization committee of the International Children's Continence Society (ICCS) [1]. Enuresis was defined as nighttime incontinence in children $>$5 years. Overactive bladder was clinically diagnosed (urinary urgency, usually accompanied by frequency and nocturia/NME, with or without urinary incontinence). Full urodynamic examination, including perineal electromyography using pad electrodes was reserved for cases that were irresponsive to empirical treatment. Constipation, if present, was always actively treated, as needed.

Overactive bladders were primarily treated with oral oxybutynin 0.2 mg/kg/dose bid. In case of an inadequate response (persistent LUTS symptoms) doses were augmented (0.2 mg/kg/dose tid). If pharmacological responses were still insufficient or the child presented