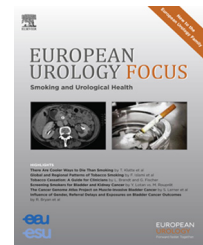


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Review – Pediatric Urology

Lower Urinary Tract Terminology in Daytime Lower Urinary Tract Symptoms in Children: A View of the Pediatric Urologist

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Abstract

Context: Epidemiological studies have demonstrated rates of lower urinary tract (LUT) symptoms in school-aged children as high as 20%. Symptoms of LUT may have significant social consequences. The diagnosis of LUT symptoms in children is mainly based on the subjective impression, and it is therefore important to translate the clinical impression into a structured LUT terminology.

Objective: To have a view, as a pediatric urologist and a urologist, of the LUT terminology proposed by the Standardization Committee of the International Children Continence Society.

Evidence acquisition: In addition to the known LUT terminology conditions that are mainly functional, we propose to add specific urological malformations due to congenital or acquired urological conditions, leading to LUT symptoms.

Evidence synthesis: In addition to the opinion-based statements and practical clinical suggestions, we have added recent literature to support the statements and suggestions.

Conclusions: LUT symptoms in children can be from a functional or an anatomical origin. As the diagnosis is often made on the basis of subjective and variable information, experience of the medical caretaker is also important to allow categorization of the condition of the child into a well-structured LUT terminology. Medical caretakers should be aware of possible evidence-based diagnostic tools and be able to follow guidelines and algorithms to come to the correct diagnosis and condition of the child to allow one to distinguish functional from congenital or acquired anatomical LUT conditions.

Patient summary: Up to 20% of school-aged children can have wetting problems. Some wetting problems can be temporary, due to the young age, stress, psychological problems, or other associated problems such as bowel dysfunction. However, some wetting problems in children are due to a condition of the kidneys, bladder, or elsewhere in the urinary tract since they were born, and should be well investigated, as in most such situations the LUT problems could be treated surgically.

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1. Introduction

According to the European pediatric urology guidelines and the International Children's Continence Society (ICCS), the lower urinary tract (LUT) terminology in children currently

consists of four themes: daytime LUT conditions, monosymptomatic enuresis, nonmonosymptomatic enuresis, and neurogenic bladder [1,2]. We will provide a pediatric urological view on the proposed present LUT terminology in daytime LUT conditions and give an update of the latest treatment options.

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It is interesting when we look at the fact that the conditions of LUT problems in children are mainly based on the history of the child, the history of the parents, a voiding diary, and questionnaires. All these are a subjective impression of the situation and can be variable in time; however, the treatment is based on the diagnosis of the condition. Additional examinations such as uroflowmetry, ultrasound, voiding cystourethrogram (VCUG), urodynamic investigations, and cystoscopy are the typical tools that a (pediatric) urologist can use to attempt to make a correct diagnosis of the condition. However, it is known that uroflowmetry and urodynamic investigations can also vary and are influenced by circumstantial situations.

In addition to the known conditions, mostly functional problems, there are specific anatomical urological malformations due to congenital or acquired urological conditions, leading to LUT symptoms. For example, children with bladder exstrophy/epispadias will require surgery to improve urinary continence, or should we call it “dryness,” in which they can void spontaneously or they require chronic clean intermittent catheterization, with and without chronic medication. There is a need for a clear definition for what is “dry” or “not dry” because this is different from being continent or incontinent. The need and proposal for a good definition of dryness in congenital malformations, such as bladder exstrophy-epispadias complex, have been proposed by several authors [3,4]. Another specific group of children with a status after posterior urethral valve (PUV) treatment, also known as the so-called “valve-bladder syndrome,” requires specific definitions and terminology. Children with a congenital renal duplication and ectopic ureter will present with continuous dribbling, another condition that does not fit the known existing classification. In addition, other congenital or acquired pediatric urological malformations such as urethral pathology, meatus malformations, and even tumors of the bladder or prostate can cause LUT symptoms.

In addition, children with psychological and psychiatric comorbidity show a higher prevalence of daytime LUT conditions [5]. Their concurrent behavioral disorders will affect 30–40% of children with daytime incontinence. It is, therefore, important to include a psychological assessment in children with daytime LUT conditions [6].

2. Evidence acquisition

In addition to the known LUT terminology conditions that are mainly functional, we propose to add specific urological malformations due to congenital or acquired urological conditions, leading to LUT symptoms.

3. Evidence synthesis

3.1. Epidemiology, etiology, and pathophysiology

There is an increasingly reported incidence of daytime LUT conditions in children as well as an increasing number of publications on this topic [1]. This may be due to the fact that there is an increasing demand of parents and our social

environment that children are “continent,” meaning in full control of storage of urine and emptying at an appropriate time and place.

The ICCS updated their report on the standardization of terminology of LUT function in children and adolescents in 2016, and “daytime LUT conditions” is currently the term that should be applied to functional urinary incontinence problems in children [1]. In the update of the terminology, there is also increasing importance and a close relationship of bowel emptying issues with bladder function, and the term “bladder and bowel dysfunction” is introduced. The previously known term “dysfunctional elimination syndrome” was used for children with associated voiding and bowel dysfunction, and is connoted a particular abnormality or condition and therefore abandoned.

From a population-based survey in a cohort of Swedish twins, there is clear evidence that there is a genetic influence for susceptibility for urinary incontinence and a rather environmental influence to develop an overactive bladder (OAB) [7]. These findings have been confirmed in another large prospective study where daytime urinary incontinence as well as nocturnal enuresis were investigated [8].

In a Swedish observational study, the occurrence of bladder sensation is found from the age of 1.5 yr; however, the median age for attaining day- and nighttime “dryness” was 2.5 and 4 yr, respectively [9]. An earlier study in the USA has observed a “toilet training age” for daytime urinary control at 2.4 ± 0.6 yr [10]. In a recent PRISMA literature review on voiding pattern in healthy preterm and term infants and toddlers, it was found that when evaluating the voiding pattern in infants, normal evaluation of micturition parameters in healthy normal developing infants must be taken into consideration [11].

3.2. Classification

Classification of daytime LUT conditions is based on a framework, described and defined by the ICCS standardization document and dependent on the information obtained from history and diaries, therefore emphasizing on the importance of those diaries [1]:

1. Incontinence (presence or absence, and symptom frequency)
2. Voiding frequency
3. Voiding urgency
4. Voided volumes
5. Fluid intake

The possible conditions are as follows:

1. Bladder and bowel dysfunction
2. OAB
3. Voiding postponement
4. Underactive bladder
5. Dysfunctional voiding
6. Bladder outlet obstruction
7. Stress incontinence

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