

Prevalence of lower urinary tract symptoms in Vilnius area children and adolescents

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Background. Lower urinary tract symptoms are a common problem worldwide among children. The aim of the study was to evaluate how common lower urinary tract symptoms are among children and adolescents in the Vilnius area.

Materials and methods. A cross-sectional study comprised 360 children (5–11 years) and 388 adolescents (12–18 years) who were hospitalized at the Children's Hospital or referred for consultation for different health reasons not related to urination problems. Data were obtained by using a self-administered anonymous questionnaire. The data were compared between gender (344 boys and 404 girls) and age groups (children and adolescents).

Results. Only a half (55.7%) of all questioned children and adolescents had no lower urinary tract symptoms. Nocturnal enuresis (NE) was found in 8.7%, urgency in 34.0% and daytime wetting in 24.6% of the questioned children and adolescents. Monosymptomatic NE accounted for 20.0% of NE. Secondary NE was seen in a quarter (24.5%) of children with NE. Lower urinary tract symptoms were more prevalent in children compared to adolescents (56.1% vs 38.1%, $p = 0.000$). There were no significant differences between genders except urgency, which was more frequent in girls (29.4% vs 37.9%, $p = 0.014$).

Conclusion. Lower urinary tract symptoms are frequent in children and adolescents in the Vilnius area, so they need greater attention by healthcare providers.

Key words: children, adolescents, lower urinary tract symptoms, nocturnal enuresis

INTRODUCTION

Lower urinary tract symptoms (LUTS) are a common problem worldwide among children.

These symptoms are not considered to be serious, nevertheless, they may indicate undiagnosed urinary tract infections and often lead to important emotional and social problems for the child as well as the family. Results range from enuretic children having no marked emotional or behavioural problems (1) to enuretic children with an increase in emotional, behavioural and academic difficulties compared with non-enuretic peers (2, 3).

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Nocturnal enuresis (NE) is three times more common than daytime wetting (4) and its prevalence is greatly varied in different countries, ranging from 3.9% to 23.8% (4–10). The aetiology of enuresis is not completely understood. Most studies have consistently found the risk factors for NE to be nocturnal polyuria, detrusor overactivity, high arousal thresholds as well as male gender, younger age, family history, constipation, a history of urinary tract infection and social factors (7–9, 11). Even less data are reported about other LUTS.

Our aim was to evaluate how common LUTS are among children and adolescents in the Vilnius area and to compare these symptoms between genders.

MATERIALS AND METHODS

A cross-sectional study was undertaken from April till December 2011 in children (5–11 years) and adolescents (12–18 years) at the Children's Hospital, Affiliate of Vilnius University Hospital, Santariškių Clinics. We included children and adolescents hospitalized or referred for consultation for different health reasons not related to urination

problems. The study was approved by the local Ethics Committee. Data were obtained by using a self-administered anonymous questionnaire which was completed by children and adolescents or by children and their parents, when the children were not able to read and answer all the questions. The response rate was high – 95%.

The questionnaire consisted of four parts:

1. Information on demographic characteristics including age, sex, and weight.
2. Micturition habits such as frequency of daytime and night-time urination.
3. Information on LUTS (NE, daytime wetting, urgency).

We used the International Children Continence Society (ICCS) terminology of LUTS (Table 1) and the classification of NE (Table 2) (12).

The study comprised 748 participants: 360 (48.1%) children (47.2% boys, 52.8% girls) and 388 (51.9%) adolescents (44.8% boys, 55.2% girls). In total, there were 344 (46.0%) boys and 404 (54.0%) girls. Age varied from 5 to 18 years (mean age – 11.3 ± 4 years). The data were compared between genders and age groups (children 5–11 years and adolescents 12–18 years).

Table 1. The International Children Continence Society definitions of lower urinary tract symptoms (12)

Lower urinary tract symptom	Definition
Increased daytime frequency	Eight or more voidings daily.
Decreased daytime frequency	Three or fewer voidings daily.
Incontinence	An uncontrolled leakage of urine.
Daytime incontinence	Incontinence during the day.
Enuresis / nocturnal incontinence	Any type of wetting episode that occurs in discrete amounts during sleep. It is applicable to children who are at least 5 years old.
Urgency	A sudden and unexpected experience of an immediate need to void.
Nocturia	Awakening at night to void.

Table 2. The classification of nocturnal enuresis (12)

Monosymptomatic enuresis (MNE)	Enuresis in children without any other lower urinary tract symptoms (nocturia excluded) and without a history of bladder dysfunction.
Nonmonosymptomatic enuresis (NMNE)	Enuresis in children with the presence of concomitant lower urinary tract symptoms: <i>Increased / decreased voiding frequency, daytime incontinence, urgency, hesitancy, straining, a weak stream, intermittency, holding maneuvers, a feeling of incomplete emptying, post-micturition, dribble and genital or lower urinary tract pain.</i>
Primary nocturnal enuresis	Enuresis in a child aged 5 years or older, who has not had a previous dry period of at least 6 months.
Secondary nocturnal enuresis	Enuresis in a child aged 5 years or older, who has had a previous dry period of at least 6 months.

Data were analysed using SPSS software 16. The Chi-square test (χ^2) was used to test statistical significance for differences between two groups. The Fisher's exact test was used when cells had an expected frequency of five or less. Statistical significance was defined by $p < 0.05$.

RESULTS

We analysed the urination habits. The average voiding frequency was five voids daily. Nine percent ($n = 66$) of children and adolescents did not know their voiding frequency. Increased daytime voiding frequency was found in 9.7% ($n = 35$) of the questioned children and 5.9% ($n = 23$) of ado-

lescents, decreased voiding frequency was found in 3.1% ($n = 11$) of children and 8.8% ($n = 34$) of adolescents. More children and adolescents with NE compared to those without NE had an increased voiding frequency (17.0% vs 7.8%, respectively, $p = 0.035$).

Only a half (55.7%) of all questioned children and adolescents had none of these LUTS: NE, urgency or daytime wetting. The majority had one symptom (Fig. 1). LUTS were more prevalent in children compared to adolescents (55.0% vs 34.3%, respectively, $p = 0.000$). There was no significant difference between girls and boys. Detailed differences of LUTS between gender and age groups are shown in Table 3.

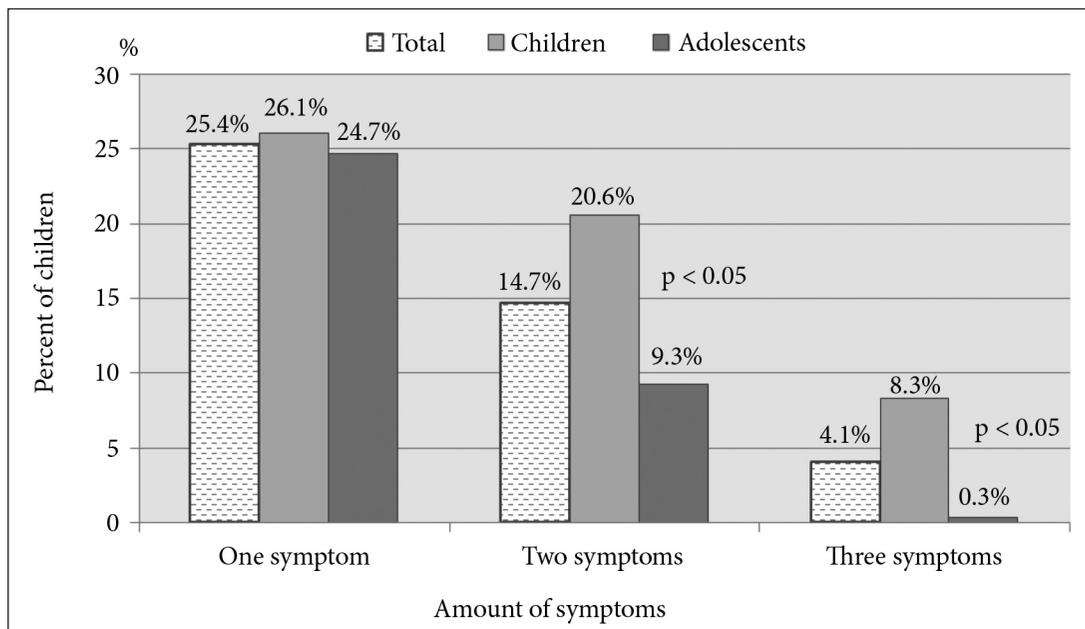


Fig. 1. The distribution of the number of lower urinary tract symptoms (nocturnal enuresis, daytime wetting, urgency)

Table 3. Differences of lower urinary tract symptoms between genders and age groups^a

Lower urinary tract symptoms	Gender			Age		
	Male (n = 344)	Female (n = 404)	P	5–11 years (n = 360)	12–18 years (n = 388)	P
Nocturia	43.9% (n = 151)	47.8% (n = 193)	$p > 0.05$	46.7% (n = 168)	45.4% (n = 176)	$p > 0.05$
Nocturnal enuresis	9.9% (n = 34)	7.7% (n = 31)	$p > 0.05$	16.9% (n = 61)	1% (n = 4)	$p = 0.000$
Urgency	29.4% (n = 101)	37.9% (n = 153)	$p = 0.014$	41.4% (n = 149)	27.1% (n = 105)	$p = 0.000$
Daytime wetting	21.5% (n = 74)	27.2% (n = 110)	$p > 0.05$	33.9% (n = 122)	16% (n = 62)	$p = 0.000$

^aSignificant differences are highlighted in grey.

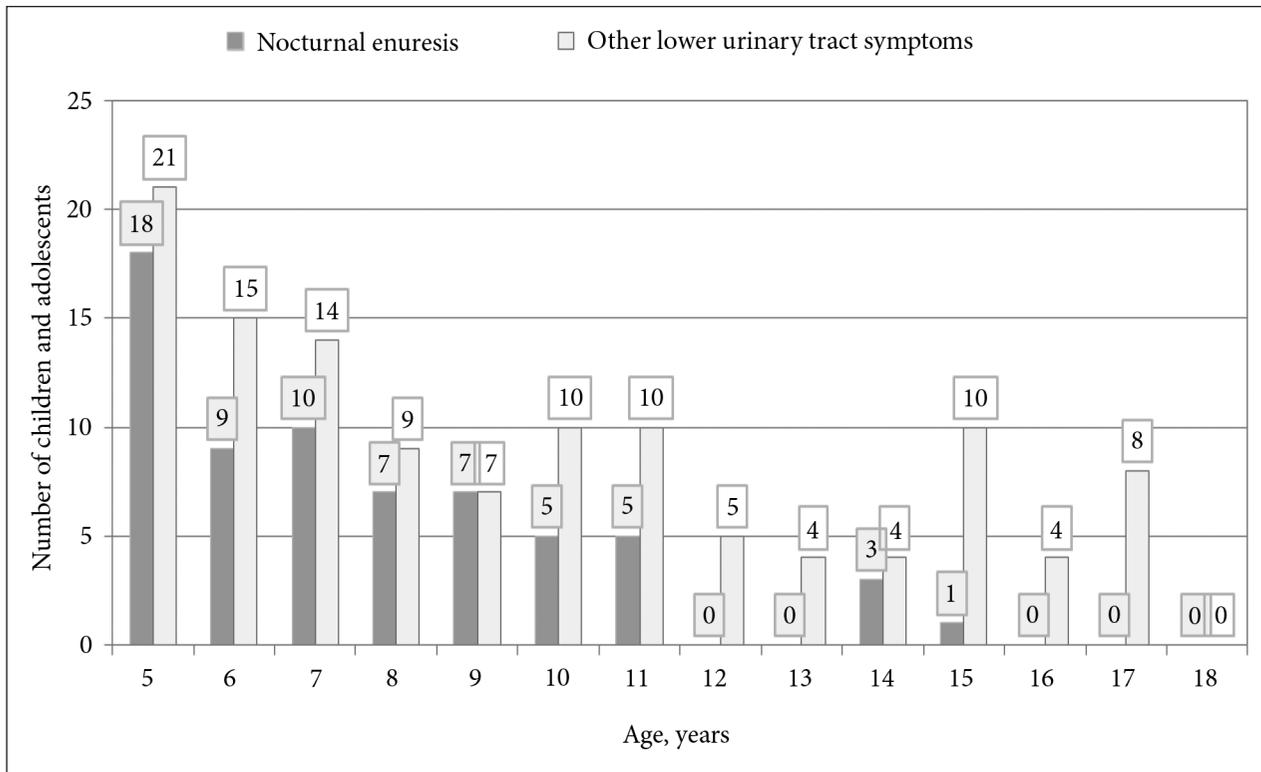


Fig. 2. Age distribution of children with nocturnal enuresis and other lower urinary tract symptoms (daytime wetting, urgency)

Totally, NE was found in 8.7%, urgency in 34.0% and daytime wetting in 24.6% of the questioned children and adolescents. Infrequent daytime wetting was described by 22.1% and frequent wetting by 2.5% of participants. Nocturia was also found to be a common symptom: 6.7% get up to urinate every night, 15.6% get up few times a week and 23.7% get up few times a month.

NE is decreasing with age (Fig. 2) and there is no significant gender difference. More than half (60.0%, $n = 39$) of those who have NE have daytime wetting as well. Monosymptomatic NE (MNE) accounts for 20.0% ($n = 13$) of NE, other being non-monosymptomatic. Secondary NE was seen in a quarter (24.5%) of children with NE. Uncommon (up to 3 days per week) bed-wetting was described in 30.8% of children with NE and more frequent (4–7 days / week) bed-wetting was found in 43.1%, without significant difference between age groups. The remainder (26.1%) did not describe the frequency of NE.

Constipation was found in 14.3% ($n = 107$), more often in children with NE (27.7% vs 13.0%, $p = 0.002$) and with daytime incontinence (26.1% vs 10.5%, $p = 0.000$).

DISCUSSION

This cross-sectional study shows a high prevalence of LUTS among children and adolescents aged 5–18 years, with urgency representing the highest number (34.0%). Previous studies of the prevalence of daytime wetting and urgency have reported results varying from 4.9 to 30.7% (4, 13, 14, 16) and from 13.7 to 45% (13, 15, 16), respectively. The results may be different because of unequal inclusion criteria, methods and terminology. Higher prevalence of LUTS in our study may be caused by self-evaluation and the involvement of preschool age children, as it is known that younger children have more LUTS (the majority of authors who reported lower prevalence had analysed LUTS in older children).

Overall incidence is quite high, however, the symptoms may be infrequent (for example, daytime wetting was seen in 24.6% of children, but only 2.5% had a frequent daytime wetting).

Increased voiding frequency varies from 2.5% to 12.8% while decreased voiding frequency is estimated to be 4.4% to 10.7% in different studies (10, 13, 16, 17). Our data shows similar results.

Decreased voiding frequency results in an increase in bladder capacity and a higher risk to develop UTI. This symptom is frequently underestimated for its risk. On the other hand, high voiding frequency might show reduced bladder capacity and be connected with daytime wetting. This symptom is disturbing to the child and parents. In our study a significant difference between children with and without NE and increased daytime wetting frequency was found. Kajiwara et al. have reported a similar correlation (10). An association between high voiding frequency and daytime wetting was also reported (17). However, during the survey we noticed that for the majority of children and adolescents or their parents it is difficult to tell the number of voids per day and 9% even could not answer this question. That limits the accuracy of data.

Most studies have shown decreasing prevalence of LUTS with increasing age (5–8, 13, 14, 15). We found that LUTS were more prevalent in children compared with adolescents. According to our data there are no significant differences between genders (except urgency). There are more differences reported in literature: NE more frequent in boys (5, 6, 8, 18) and LUTS more common in girls (13–15, 18, 19). This unusual finding might be explained by the weak side of the questionnaire or rise some questions for further discussion.

The current study found NE in 8.7% of the questioned children without a significant difference in gender while other authors reported a higher incidence in boys (5, 6, 8) though there is no explanation of male gender predominance in these studies. NE decreases with increasing age, as it is described in many studies (5–8). This symptom is probably decreasing after successful treatment or children “out-grow” the problem.

It was noticed that MNE numbers dramatically change after directed anamnesis and the completion of a voiding map: 37.4% of patients were referred for nonmonosymptomatic enuresis (NMNE) and about 62.6% for MNE, but after medical evaluation these numbers have dramatically changed (20). In our study MNE was found in 20.0% of children with NE without using any additional medical evaluation, and the data are similar to the findings previously reported in literature – MNE ranging from 12.6 to 38.8% (11, 21). Secondary NE accounted for 24.5% of children with NE,

similar results, a variation from 15.3% to 37.2%, are reported by others (7, 8, 21, 22).

Constipation, defined as defecation frequency of <3 times per week, is a common problem in children worldwide and its prevalence in general populations has been reported to range from 0.7% to 29.6% (23). Constipation is often associated with LUTS. According to Loening-Baucke, significantly more children with constipation than children without constipation suffer from NE (12.6% vs 3.3%) and any kind of urinary incontinence (21.8% vs 7.3%) (18). We also found the association between constipation and NE as well as constipation and daytime incontinence.

LUTS for some children are an embarrassing problem and they may want to hide it from others or just ignore it. A limitation of our study is that we did not evaluate how well children or their parents understood the questions. It would be desirable to conduct a larger population-based study. Psychological and social aspects of the problem need to be evaluated as well.

CONCLUSIONS

Our study shows that LUTS are frequent in children and adolescents in the Vilnius area, so they need greater attention by healthcare providers. Proper diagnosis should be made and treatment should be started early in order to reduce LUTS in adulthood.

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APATINIŲ ŠLAPIMO TAKŲ SIMPTOMŲ PAPLITIMAS TARP VAIKŲ IR PAAUGLIŲ VILNIAUS KRAŠTE

Santrauka

Įžanga. Apatinių šlapimo takų simptomai yra dažna vaikų problema visame pasaulyje. Mūsų darbo tikslas – ištirti apatinių šlapimo takų simptomų dažnį tarp Vilniaus vaikų ir paauglių.

Tyrimo medžiaga ir metodai. Į tyrimą įtraukta 360 vaikų (5–11 metų) ir 388 paauglių (12–18 metų), kurie buvo hospitalizuoti į Vaikų ligoninę ar atsiųsti

konsultacijai dėl kitų sveikatos sutrikimų, nesusijusių su šlapinimosi problemomis. Duomenys surinkti naudojant autorių sudarytą anoniminį klausimyną ir palyginti tarp lyčių (344 berniukų ir 404 mergaičių) ir amžiaus grupių (vaikų ir paauglių).

Rezultatai. Tik pusė (55,7 %) apklaustų vaikų ir paauglių neturėjo apatinių šlapimo takų simptomų. Naktinis šlapimo nelaikymas (NŠN) rastas 8,7 %, staigus noras šlapintis – 34,0 % ir dieninis šlapimo nelaikymas – 24,6 % apklaustų vaikų ir paauglių. Monosimptominis NŠN sudarė 20,0 % NŠN. Antrinis NŠN nustatytas ketvirtadaliui (24,5 %) vaikų, turinčių NŠN problemų. Vaikai turėjo daugiau apatinių šlapimo takų simptomų, palyginti su paaugliais (56,1 % vs 38,1 %, $p = 0,000$). Tarp lyčių nerasta statistiškai reikšmingų skirtumų, išskyrus staigų norą šlapintis, kuris buvo dažnesnis mergaitėms (29,4 % vs 37,9 %, $p = 0,014$).

Išvada. Apatinių šlapimo takų simptomai yra dažna Vilniaus vaikų ir paauglių problema, todėl jai reikalingas didesnis sveikatos priežiūros specialistų dėmesys.

Raktažodžiai: vaikai, paaugliai, apatinių šlapimo takų simptomai, naktinis šlapimo nelaikymas

