Prevalence and Associated Factors of Daytime Lower Urinary Tract Dysfunction in Students of Two Primary Schools of Turkey with Different Socioeconomic Status

Türkiye'de Sosyoekonomik Düzeyi Farklı İki İlköğretim Okulundaki Öğrencilerde Gündüz Alt Üriner Sistem Semptom Bozukluğu Sıklığı ve Etkileyen Faktörler

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ABSTRACT Objective: This study aimed to evaluate the prevalence and associated factors of daytime lower urinary tract dysfunction (DLUTD) in different socioeconomic environments. **Material and Methods:** Two questionnaires, one was for urological history, demographic and physical characteristics and the other was the Pediatric Lower Urinary Tract Symptom Score (PLUTSS) form, were distributed to 712 parents of primary school children. Of these children, 339 were in a primary school in Batıkent, a lower socioeconomic region of Ankara and 373 were in Cankaya, a higher socioeconomic region of Ankara. The prevalence of DLUTD and the impact of accompanying factors of these children from different socioeconomic environments were compared. **Results:** Of the 712 questionnaires distributed, 335 were returned. The prevalence of DLUTD was 7.2% and significantly more common in children with lower socioeconomic status ($p< 0.05$). The results of the study shows that monthly income and education levels of families, family history, history of urinary tract infection, personal characteristics, having a systemic disease and education age of daytime voiding control were statistically significant factors affecting DLUTD ($p< 0.05$). **Conclusion:** These findings denote that prevalence of DLUTD in the study is compatible with reported in literature. The main problem seems to be inadequate education and low socioeconomic level.

Key Words: Urinary incontinence; urinary bladder, neurogenic; urination disorders; prevalence; child; diurnal enuresis

ÖZET Amaç: Bu çalışmanın amacı sosyoekonomik düzeyi farklı çevrelerde gündüz alt üriner sistem semptom bozukluğu (GAÜSSB) sıklığını ve bu durumu etkileyen faktörleri ortaya koymaktır. **Gereç ve Yöntemler:** Yediyüzoniki ilköğretim çocuğunun ailesine ürolojik geçmişi, demografik ve fiziksel karakteristikleri değerlendiren sorgulama formu ve Pediatrik Alt Üriner Sistem Semptom Skorlama (PAÜSSS) anketi dağıtıldı. Çocukların 339'u Ankara'nın düşük sosyoekonomik bölgesi olan Batıkent'teki bir ilköğretim okulundan, 373'ü Ankara'nın yüksek sosyoekonomik bölgesi olan Çankaya'daki bir ilköğretim okulundan seçildi. Bu farklı sosyoekonomik bölgelerdeki çocuklarda, GAÜSSB sıklığı ve etkileyen faktörler birbiri ile karşılaştırıldı. **Bulgular:** Dağıtılan 712 sorgulama formunun 335'i geri döndü. GAÜSSB sıklığı % 7.2 olarak bulundu ve sosyoekonomik düzeyi düşük olanlarda önemli ölçüde daha yaygın olduğu saptandı ($p< 0.05$). Sonuçlar, aylık hane halkı geliri, ailelerin eğitim düzeyi, pozitif aile hikayesi, geçirilmiş idrar yolu enfeksiyonu, kişilik özellikleri, sistemik hastalık bulunması ve gündüz idrar eğitim yaşı bulgularının istatistiksel olarak anlamlı düzeyde GAÜSSB'nu etkileyen faktörler olduğunu ortaya koydu ($p< 0.05$). **Sonuç:** Bu bulgular, çalışmada bulunan GAÜSSB sıklığının literatürle uyumlu olduğunu ortaya koymaktadır. Asıl sorunun yetersiz eğitim ve düşük sosyoekonomik düzey olduğu görülmektedir.

Anahtar Kelimeler: Üriner inkontinans; mesane, nörojenik; İşeme bozuklukları; prevalans; çocuk; güniçinde idrar kaçırma

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Daytime lower urinary tract dysfunction (DLUTD) is a common clinical entity of childhood and can cause serious problems for children and their families. The reported prevalence of voiding dysfunction was from 2% to 7% in a previous study.[1] Approximately, 40% of patients presenting to pediatric urologist are assumed to have DLUTD.[2,3] International Children's Continence Society (ICCS) published the standardization of terminology of lower urinary tract function in children and adolescents in 2006.[4] ICCS defined DLUTD as a condition in neurologically normal children which contains, over active bladder, urge incontinence, stress incontinence, voiding postponement, obstruction, underactive bladder, vaginal reflux, giggle incontinence, vaginal reflux and extraordinary daytime frequency. Despite neurogenic lower urinary track dysfunction is caused by various diseases and events affecting the nervous system controlling the LUT, there is no anatomic and neurogenic disease in DLUTD. In contrast to previous terminology, the terms nocturnal incontinence and enuresis are now synonymous. Enuresis in children without any other LUT symptoms (nocturia excluded) and without a history of bladder dysfunction is defined as monosymptomatic enuresis. Other children with enuresis and any other LUT symptoms are said to experience nonmonosymptomatic enuresis.[4] The findings, published in studies, suggest that factors associated with low socioeconomic status increase the prevalence of enuresis in childhood.[5,6] Despite there were some studies on the prevalence of enuresis, there are no data on the prevalence and causes of DLUTD in Turkish children. This article presents the first population-based data about DLUTD in Turkish children.

The purpose of this study was to determine the prevalence and associated factors of DLUTD in Turkish children with different socioeconomic status.

MATERIAL AND METHODS

To evaluate the voiding characteristics of primary school children questionnaires were used. Two questionnaires, one was for urological and non-urological history, familial conditions, demographic and personal characteristics and the other was the Pediatric Lower Urinary Tract Symptom Score (PLUTSS) form, were distributed to parents of primary school children. Of these parents who were invited to take part in the study, 712 accepted the invitation and were enrolled in the study. First questionnaire comprises 23 questions, was composed of items regarding monthly income of family, family size, parental education levels, history of urological and non-urological disease, if male circumcised or not, ages for daytime and night-time continence achievement and defecation control, problems in pregnancy, history of developmental retardation, school performance and personal characteristics. Other questionnaire was the PLUTSS form, which has been validated previously.[7] A total score >8.5 was used to determine the children with DLUTD. The questionnaires were asked to be filled by the parents and children together. Of these 712 children, 339 were in a primary school in Batıkent, a lower socioeconomic region of Ankara and 373 were in Cankaya, a higher socioeconomic region of Ankara. The prevalence of DLUTD and the impact of accompanying factors of these children from different socioeconomic environments were compared.

STATISTICAL ANALYSIS

Statistical analyses were performed using Statistical Package for Social Sciences (SPSS) 17.0 for Windows. The values were expressed as mean ± SD or numbers and percentages. Chi-square and logistic regression test were used for analyzing the associated factors of DLUTD of these children. P value <0.05 was considered to be statistically significant.

This study was approved by Baskent University Institutional Review Board (Project no. KA09/167) and supported by Baskent University Research Fund.

RESULTS

Of the 712 questionnaires distributed, 335 were returned (male/female 160/175). The mean age of

TABLE 1: Statistically analysis of some characteristics of children with or without DLUTD.

	DLUTD		
	PLUTSS> 8.5	PLUTSS< 8.5	
	mean ± SD	mean ± SD	p*
Age (year)	8.88 ± 1.75	8.94 ± 1.49	> 0.05
Number of siblings	1.96 ± 1.23	1.57 ± 1.44	> 0.05
Age of daytime voiding control	2.60 ± 1.47	2.27 ± 0.82	< 0.05
Age of night-time voiding control	3.14 ± 1.42	2.78 ± 1.27	> 0.05
Age of defecation control	2.80 ± 1.67	2.62 ± 1.06	> 0.05
Monthly mean income of families (USD)	1185 ± 1482	2578 ± 2260	< 0.05

DLUTD: Daytime lower urinary tract dysfunction

* t-test

children in both study groups was 8.94±1.5 years. There were 69, 93, 80, 52 and 41 children in 1., 2., 3., 4. and 5. class, respectively. Mean age and number of siblings of children with PLUTSS below and above 8.5 are given in Table 1. The gender of the subjects was equally distributed (52.2% males, 47.8% females). The prevalence rate was found to be 8% for the girls and 6.3% for the boys (p> 0.05; Table 2). PLUTSS was within normal ranges in 311 children (<8.5). The overall prevalence of DLUTD was 7.2 % and significantly more common in children with lower socioeconomic status (p< 0.05).

The monthly mean income of the families was also documented in the questionnaire. Of the 335 families, 14% had a monthly income <400 USD, 18.5% had 400-600 USD, 14.6% had 600-800 USD, 6.9% had 800-1000 USD, 46% had >1000 USD. DLUTD was significantly more common in families with lower monthly income (p< 0.05; Table 3). Mother and father education levels were asked in questionnaire. In families with lower education levels DLUTD rates were found to be significantly more common (p< 0.05; Table 3).

The distribution of ages for daytime and nighttime continence achievement and defecation control of children with PLUTSS below and above 8.5 is given in Table 1. Statistical analysis of the effect of bad or good school performance, having divorced parents, problems in pregnancy, circumcision and developmental retardation revealed that there was not any statistically significant difference bet-

TABLE 2: General properties that related to DLUTD.

	N	PLUTSS> 8.5 % (n)	PLUTSS< 8.5 % (n)
School			
Primary school in Çankaya	131	1.5 (2)	98.5 (129)
Primary school in Batıkent	204	10.8 (22)	89.2 (182)
		χ^2 = 10.279	p= 0.001
Class			
1	69	13 (9)	87 (60)
2	93	4.3 (4)	95.7 (89)
3	80	3.8 (3)	96.3 (77)
4	52	11.5 (6)	88.5 (46)
5	41	4.9 (2)	95.1 (39)
		χ^2 = 7.953	p= 0.093
Gender			
Female	175	8 (14)	92 (161)
Male	160	6.3 (10)	93.8 (150)
		χ^2 =0.385	p= 0.535
Parents			
Together	302	7.9 (24)	92.1 (278)
Divorced	22	-	100 (22)
Single parent	11	-	100 (11)
		χ^2 = 2.825	p= 0.244
School performance			
Poor	0	-	-
Intermediate	26	3 (11.5)	88.5 (23)
Good	139	7.2 (10)	92.8 (129)
Very good	170	6.5 (11)	93.5 (159)
		χ^2 = 0.871	p= 0.647
Personality			
Shy	76	14.5 (11)	85.5 (65)
Extrovert	219	5 (11)	95 (208)
Introvert	40	5 (2)	95 (38)
		χ^2 = 7.897	p= 0.019

n: number of children in groups N: total number of children.

TABLE 3: The frequency of DLUTD in relation to socioeconomic factors.

	N	PLUTSS> 8.5 % (n)	PLUTSS< 8.5 % (n)
Education level of mother			
Unlettered	7	14.3 (1)	85.7 (6)
Primary school	123	15.4 (19)	84.6 (104)
High school	85	3.5 (3)	96.5 (82)
University	120	0.8 (1)	99.2 (119)
		χ^2 = 22.142	p= 0.000
Education level of father			
Unlettered	1	-	100 (1)
Primary school	98	18.4 (18)	81.6 (80)
High school	102	3.9 (4)	96.1 (98)
University	134	1.5 (2)	98.5 (132)
		χ^2 = 26.664	p= 0.000
Monthly income of families (USD)			
<400	47	14.9 (7)	85.1 (40)
400-600	62	16.1 (10)	83.9 (52)
600-800	49	6.1 (3)	93.9 (46)
800-1000	23	4.3 (1)	95.7 (22)
>1000	154	1.9 (3)	98.1 (151)
		χ^2 = 18.368	p= 0.001

n: number of children in groups N: total number of children.

ween children with DLUTD and normal children (p> 0.05; Table 4).

The results of the study shows that monthly income and education levels of families, history of enuresis in family, history of urinary tract infection, personal characteristics, having a systemic disease and education age of daytime voiding control were statistically significant factors affecting DLUTD (p< 0.05).

DISCUSSION

DLUTD is a common problem, affecting pediatric population. The diagnosis of DLUTD should be made in the age groups in which toilet training has been achieved. In most countries the prevalence of DLUTD among 6-11 years old children was reported as 2-7%.[1] The prevalence of enuresis has been determined in some studies in our country.[8,9] In a previous study reported from Turkey, the prevalence of monosymptomatic and non-monosymptomatic enuresis was reported as 17.5% and 1.9% respectively.[9] In contrast to these studies there is an absence of studies showing the prevalence and associated factors of DLUTD in Turkish children. In our study we obtained the prevalence of DLUTD in Turkish children at 6-12 years of age as 7.2%.

Previous studies suggested that enuresis is encountered more often among children of families with lower education level and socioeconomic status.[8-11] Similarly in our study DLUTD had a higher prevalence in the children from families with lower educational level and socioeconomic status. Despite higher prevalence rates reported with increasing numbers of siblings in other studies[8,9], our survey showed no significant difference between smaller and larger families.

TABLE 4: Medical history and frequency of DLUTD.

	N	PLUTSS> 8.5 % (n)	PLUTSS< 8.5 % (n)
Family history			
No	287	4.9 (14)	95.1 (273)
Sibling	22	27.3 (6)	72.7 (16)
Mother	13	7.7 (1)	92.3 (12)
Father	5	20 (1)	80 (4)
More than one person	7	14.3 (1)	85.7 (6)
		χ^2= 18.017	p= 0,001
Pregnancy/ Birth			
Normal	315	7.3 (23)	92.7 (297)
With problems	19	-	100 (19)
		χ^2 = 1.490	p= 0.222
Infancy			
Normal development	328	7 (23)	93 (305)
Developmental retardation	7	14.3 (1)	85.7 (6)
		χ^2 = 0.545	p= 0.46
Circumcised males			
Yes	122	4.9 (6)	95.1 (116)
No	39	10.3 (4)	89.7 (35)
		χ^2 = 1.446	p= 0.229
Urinary tract infection history			
Yes	50	18 (9)	82 (41)
No	285	5.3 (15)	94.7 (270)
		χ^2 = 10.376	p= 0.001
Non-urological disease history			
Yes	15	20 (3)	80 (12)
No	320	6.6 (21)	93.4 (299)
		χ^2 = 3,890	p= 0.049

n: number of children in groups, N: total number of children.

The prevalence rate of DLUTD is significantly more common in families with a history of enuresis in our study. Twin studies also support a genetic basis for enuresis. The concordance rate is much higher in monozygotic twins (36%).[12] Previous studies could not demonstrate a specific behavioral profile in children with enuresis.[13-15] In the present study prevalence of DLUTD was found to be significantly more common in children with shy personal characteristics. Also there was no certain answer if shy personal characteristic is an etiological factor or a result of DLUTD.

Turkish families widely accept circumcision as one of the milestones in the lives of male children. Although female circumcision has never been performed among Turkish tribes, male circumcision is generally performed in Turkey (prevalence 99%) at any time between the period of birth and marriage, generally before the school age according to the Islamic and traditional points of view.[16] In a previous study, it was shown that newborn circumcision decreases incidence and costs of urinary tract infections during the first year of life.[17] However, in our study prevalence of DLUTD was similar in circumcised and uncircumcised male children

In our study most of parents reported that their children had achieved daytime and night-time continence, respectively within the first 3 years of life. Our findings showed that age of daytime voiding achievement is higher in children with DLUTD. Previously reported factors that significantly related to enuresis like divorced parents, low birth rate, growth retardation, history of urinary tract infection bronchial asthma and allergy were also surveyed in our study.[18-21] Only history of systemic disease and urinary tract infection were found to be statistically significant factors of DLUTD.

Because of the fact that especially in lower socioeconomic regions, Turkish families do not have adequate attention about DLUTD and the problem was managed primarily within the family, more health care facilities and informative studies needed in our country.[10] A further study with a similar design which compares adolescent age groups would be relevant to determine the prevalence rates of DLUTD in adolescent ages in Turkey.

CONCLUSION

These findings denote that prevalence and associated factors of DLUTD in the study is compatible with reported in various countries. The main problem seems to be inadequate education and low socioeconomic level. Physicians and health personnel should inform the patients about DLUTD especially in suburban regions in order to prevent possible complications.

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