



Prevalence of enuresis nocturna among a group of primary school children living in Diyarbakır

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ABSTRACT

Objective: In this study, the prevalence of enuresis nocturna (EN) was investigated among primary school children living in Diyarbakır.

Material and methods: Five primary schools in the center of Diyarbakır and a village primary school were selected randomly. Four thousand and five hundred self-administered questionnaires were distributed to parents; 4300 were returned, and 4203 of these questionnaires were included in this study.

Results: Of the children participating in the study, 52.2% of them were boys and 47.8% of them were girls. The mean age of the children was 8.66±1.61 (6-15) years, and the mean number of siblings was 4.03±2.06 (0-13). The prevalence of nocturnal enuresis was determined to be 25.9% (1087) among 4203 children, and it was more common in boys than in girls (27.8 and 23.7%, respectively). The rate of a positive family history in the nocturnal enuresis, and nonenuretic groups were 64.8, and 35.2%, respectively. The average number of siblings in the enuretic, and nonenuretic groups were 4.49±2.65, and 3.87±2.57, respectively. Socioeconomic level of the families of enuretic children was worse than that of nonenuretic children. Enuretic children had episodes of bedwetting (92.3%) during night hours or both day and night (8.7%). The number of bed wetting incidents per week was 4.1±2.2. A minority (5.7%) of the families believed that the condition resolved without any treatment.

Conclusion: Family history, a low socioeconomic level and an increased number of children were factors that increased the frequency of enuresis nocturna in our region.

Key words: Child; enuresis nocturna; prevalence; school-age.

Introduction

Enuresis nocturna (EN) is one of the most frequently encountered urinary system diseases in the pediatric age group. International Children's Continence Society (ICSS) defined enuresis nocturna as 'intermittent involuntary leakage of urine during sleep.'^[1] In the etiology of EN, in addition to genetic factors, delay in maturation, stress, sleeping disorders, detrusor instability, decrease in nocturnal antidiuretic hormone secretion, and functional bladder capacity, psychogenic factors, environmental, and individual factors have been thought to play a role.^[2]

Although enuresis nocturna is a frequently encountered problem in the pediatric age group, during preschool period families usu-

ally do not pay importance to this issue. However with the start of the school age it becomes an important health problem because of unfavourable psychosocial factors it induces.^[3,4] Therefore, families generally start to find a treatment modality or a solution with the beginning of school age.

In our country, prevalence of EN differs among various age groups, and it has been reported to be between 12.4 and 25 percent.^[3,5,6] Since studies performed have not provided any data about its prevalence in Southeastern Anatolia, we aimed to report the prevalence of enuresis nocturna, etiological factors, and opinions of families about treatment modalities among a group of primary school children living in Diyarbakır.

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Material and methods

We obtained permission from Directorate of National Education of the Diyarbakır province for the distribution of questionnaire forms prepared to determine the prevalence of EN among primary school children. Then required documents, and information were prepared, and approval for the study was obtained from the Ethics Committee of Dicle University Faculty of Medicine on 04.07.2011 with the decree #80. Two schools in Bağlar county in the city center of Diyarbakır, one school in Kayapınar county, and a village primary school in the city center were randomly chosen for the study. A total of 4500 questionnaire forms were sent to the families of the children in sealed, and closed envelopes without informing the children about their content.

From a total of 4500 questionnaire forms, 4300 of them from the volunteered families were delivered to us through class teachers. Ninety-seven forms were excluded from the analysis because of missing data. Thus remaining 4203 (93.4%) forms were included in the evaluation. Questionnaire forms consisted of three main parts. In the first part income of the families, number of the family members, and family history of enuresis nocturna were interrogated. In the second part, medical information about the affected child was obtained. We inquired about symptoms of bedwetting (if any), duration of these symptoms, and difference between night and day. Besides, concomitant complaints, and medical aid they sought for the treatment of bedwetting were questioned. The last part of the questionnaire form was designed to inquire the opinions of the parents about EN, and its treatment modalities. The parents were requested to complete these forms, and insert them into priorly provided empty envelopes. Then the envelopes were sealed and delivered to class teachers without any name or signature on them. Generally, demographic characteristics, and data specific to enuretic, and nonenuretic children were documented.

Statistical analysis

Data were analyzed using "Statistical Package for Social Sciences Programme (SPSS) 10.0" For the analysis of categorical data chi-square test was used. Logistic regression analysis was used to determine risk factors effecting enuresis nocturna. $P < 0.05$ was accepted as a statistically significant level.

Sampling volume

In studies performed in various cities concerning frequency of enuresis nocturna in primary school children, incidence of enuresis nocturna has been found to be between 10, and 25 percent. We have taken an incidence of enuresis nocturna in the Diyarbakır province as 20% into consideration, with a margin of error of 1% within 95% of confidence interval using an Epi Info 2000 statistical program, and accordingly we estimated that 4300 questionnaire forms should be evaluated. A total of 4500 questionnaire forms were distributed to schools, and 4300 of

them were completed and returned to us. Because of errors seen during entry of data into computerized system, 97 questionnaire forms were excluded from the analysis.

Results

From a total of 4500 questionnaire forms delivered to the families, 4203 (93.4%) of them were included in the study. According to data included in our registry, our study population consisted of 2192 (52.2%) male, and 2011 female (47.8%) children, Mean age of the children was 8.66 ± 1.61 (6-15) years, with a mean number of 4.03 ± 2.06 (0-13) siblings. In 1087 of 4203 children (25.9%) enuresis nocturna was detected, while 3116 children were non-enuretic.

In 611 of 2192 (27.8%) male, and 476 of 2011 (23.7%) female children, EN was detected which were statistically significant ($p < 0.05$). In 64.8% of enuretic cases, family history of enuresis was detected. However in only of 35.2% of nonenuretic cases, family history of non-enuresis was revealed ($p < 0.05$).

Number of siblings of enuretic, and nonenuretic children were 4.49 ± 2.65 , and 3.87 ± 2.57 with a statistically significant difference between these two groups ($p < 0.05$). General demographic characteristics of enuretic, and nonenuretic cases included in the study were compared between groups, and summarized data are shown in Table 1. Yearly incomes of the families of the enuretic children were significantly different from those of the families with nonenuretic children ($p < 0.05$) (Table 2).

Enuretic children were incontinent during night (92.3%) or both night, and day (8.7%). Mean number of bedwetting days were 4.1 ± 2.2 days a week. A 14.5% of the cases with EN were secondary enuretic. In secondary enuretic patients history of constipation (11%), and fecal incontinence (2.3%) was detected. Concomitant constipation was seen 14.9% of enuretic, and 9.6% of nonenuretic individuals. Fecal incontinence was detected in 3.6% of enuretic, and 1.7% of nonenuretic individuals. These two complaints associated with enuresis nocturna were more frequently detected in the incontinent group.

When opinions of the families about their children's bedwetting were requested, in 80-85% of the parents they described enuresis nocturna as 'a condition which passes away spontaneously without treatment'. When their thoughts about drug treatment were inquired, 5.7% of them responded that these drugs caused infertility.

Discussion

Since EN is a condition known for centuries, in many countries, and in various regions of our country numerous studies have

been conducted to determine its incidence, and factors effective on its epidemiology, and etiopathogenesis. Because of its familial predisposition, non-fatality, and most important of all owing to expectations for spontaneous resolution, family of the enuretic child does not seek medical help. Therefore, incidence of EN is usually tried to be determined by conducting medical fieldworks.

We detected enuresis nocturna in 25.9% of 4203 children investigated in our study. In various studies performed worldwide, diverse outcomes have been obtained. In a study on 3521 children in Hong Kong conducted by Yeung et al.^[7], incidence of EN was found to be 31.5 percent. Sureshkumar et al.^[8] detected EN in 18.2% of 2856 children. Safarinejad et al.^[9] found EN in 6.8% of 7562 Iranian children. In our country, frequency rates of EN estimated by some researchers in various cities of our country were 20.8% in Kayseri (Ünalán et al.^[10]), 13.7% in Manisa (Gümüő et al.^[11]), 10.5-25.5% in Istanbul^[12,13], 14.8% in Erzurum (Őahin et al.^[5]), 25% in Düzce (Akman et al.^[14]). We detected similarities between our prevalence rates, and those of the other studies performed in Turkey (Figure 1).^[15-19]

In our study, we detected higher rates of EN in male children. We reviewed many publications related to EN both in our country, and in the world, and observed comparable outcomes among studies.^[5,10-14] In many research studies, EN has been more frequently encountered in multi-child families, because of poor toilet hygiene, and child care.^[10] In our study, enuretic children had significantly greater number of siblings (median, 4.4 siblings) when compared with nonenuretic children. The

results we obtained in our region where number of children in the family was above the average of Turkey, reinforced relevant outcomes reported in the literature.

In our study, enuretic children had been wetting their beds at an average of 4.1 nights a week which was comparable to the frequency of bedwetting (3.98 days a week) reported by arman et al.^[12]. Bozlu et al.^[3] reported the incidence rates of bedwetting as 19.3% for every night, 30.3% for a few nights a week, and 37.2% for one night or less. Őahin et al.^[5] detected that 32.3% of the children had bedwetting episodes every night, 19.3% of them had only 2-3 episodes a month. As seen in these studies, and also other investigations cited in the literature, majority of the patients had enuretic episodes 3-4 times a week during sleeping hours at night. In this case increased frequency of enuretic episodes might conceivably worsen preexisting psychological problems of the child. Problematic issues caused by bedwetting every night can urge the family to use various treatment modalities.^[20]

We detected positive family history in 64.8% of the enuretic children. Many authors reported different rates of familial predisposition in diverse percentages of enuretic children (arman et al.^[12] 55.9%, 73/1309 139; Őahin et al.^[5] 27.5%, 176/6400, and Akman et al.^[14] 40%; 420/1048) Our investigation demonstrated higher incidence of relevant familial predisposition when compared with other literature studies. We have thought that higher rates of consanguineous marriages peculiar to our region might increase transmission of an enuretic trait through generations.^[21] However we think that further studies should be performed on this issue.

In our study, we observed that 95.7% of the parents did not refer their enuretic children to a physician for medical help. Previous studies on this issue demonstrated that 1.2-28% of the parents had sought for medical help.^[7,12,22] Also in our study, we wanted

Table 1. Demographic characteristics of the study population

	Enuresis (+)	Enuresis (-)	p value
Number of cases	1087	3116	-
Age (mean±SD)	8.62±1.60	8.66±1.71	0.393
Male/female children	611-476	1581-1535	(p<0.05)
Number of siblings	4.49±2.65	3.87±2.57	(p<0.05)
Family history of enuresis	712	386	(p<0.05)

Table 2. Incidence of enuresis nocturna based of monthly incomes

Monthly income (TL)	Enuresis (+)	Enuresis (-)	p value
<250 TL	29.50%	70.50%	(p<0.05)
250-500 TL	31.80%	68.20%	
500-1000 TL	24.90%	75.10%	
>1000 TL	22.50%	77.50%	

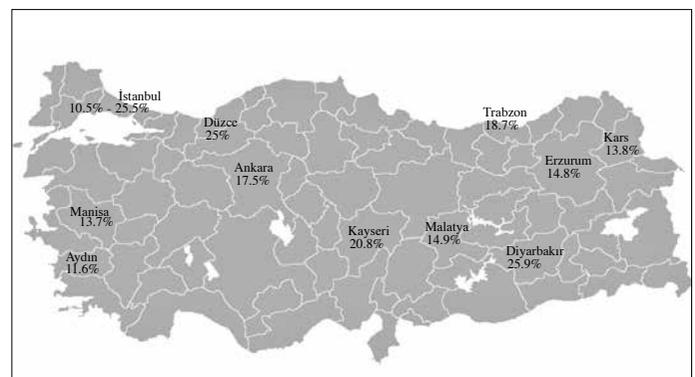


Figure 1. Prevalence rates of enuresis nocturna in various provinces of Turkey

to know the opinions of the families about enuresis nocturna. Majority (80.5%) of the families stated that bedwetting did not require medical treatment, and underlined their belief about spontaneous resolution of EN.

Most of the studies which investigated the relationship between socioeconomic status, and incidence of enuresis, have revealed higher rates of EN in families with poor socioeconomic status.^[3,11,23] In our study, we noticed decrease in EN incidence in families with higher yearly incomes.

The only factor effecting expectations of the parents is not only related to the age of the children, and duration of the disease. Spontaneously resolved cases in some family members with EN during the years of late childhood might preclude family from seeking medical help. Unrealistic rumours about treatment modalities, drugs, and their side effects are important obstacles preventing people from consulting a medical specialist. In our study we wanted to know the opinions of the families about antienuretic drugs. Most (88.9%) of the parents did not express any opinion on this issue, and 5.7% them believed that these drugs caused infertility. In a study by Çarman et al.^[12] 81.6% of the parents did not express any opinion, and 4% them were convinced about infertility potential of the drugs.

With our investigation we wanted to have an opinion about prevalence of EN in the city of Diyarbakır which is not regarded as an important issue in our community for various reasons. In conclusion, in every one of 4 children enuresis nocturna was detected. In these enuretic children, family history of EN is a serious risk factor. In addition, lower socioeconomic level, and higher number of siblings increased this risk.

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References

1. Neveus T, von Gontard A, Hoebcke P, Hjalmas K, Bauer S, Bower W, et al. The standardization of terminology of lower urinary tract function in children and adolescents: Report from the standardization committee of the international children's continence society. *J Urol* 2006;176:314-24. [\[CrossRef\]](#)
2. Koff SA. Enuresis. Ed: Walsh PC, Retik AB, Vaughan ED, Wein AJ. *Campbell's Urology*. Philadelphia: WB Saunders Company; 1998.p.2055-68.
3. Bozlu M, Çayan S, Doruk E, Canpolat B, Akbay E. Epidemiology of nocturnal and diurnal enuresis in the pediatric, and adolescent age group. *Turkish Journal of Urology* 2002;28:70-5.
4. Moffatt ME. Nocturnal enuresis--is there a rationale for treatment? *Scand J Urol Nephrol Suppl* 1994;163:55-66.
5. Şahin C, Şahin O, Güraksın A. Frequency of enuresis, and influential factors in primary school children in the province of Erzurum. *Turkish Journal of Urology* 2001;27:447-55.
6. Gumus B, Vurgun N, Lekili M, Iscan A, Muezzinoglu T, Buyuksu C. Prevalence of nocturnal enuresis and accompanying factors in children aged 7-11 years in turkey. *Acta Paediatr* 1999;88:1369-72. [\[CrossRef\]](#)
7. Yeung CK. Nocturnal enuresis in hong kong: Different chinese phenotypes. *Scand J Urol Nephrol Suppl* 1997;183:17-21.
8. Sureshkumar P, Jones M, Caldwell PH, Craig JC. Risk factors for nocturnal enuresis in school-age children. *J Urol* 2009;182:2893-9. [\[CrossRef\]](#)
9. Safarinejad MR. Prevalence of nocturnal enuresis, risk factors, associated familial factors and urinary pathology among school children in Iran. *J Pediatr Urol* 2007;3:443-52. [\[CrossRef\]](#)
10. Ünalın D, Çetinkaya F, Baştürk M. Prevalence, and characteristic features of enuresis nocturna in the 7-12 age group in the urban environment. *Anadolu Psikiyatri Dergisi* 2001;2:175-82.
11. Gümüş B, Vurgun N, Lekili M, Işcan A, Muezzinoglu T, Buyuksu C. Prevalence of nocturnal enuresis and accompanying factors in children aged 7-11 years in Turkey. *Acta Paediatr* 1999;88:1369-72. [\[CrossRef\]](#)
12. Çarman KB, Nuhoğlu Ç, Ceran Ö. Prevalence of enuresis nocturna in a group of children in Umraniye County of İstanbul. *Türk Arch Ped* 2003;38:153-9.
13. Abalı O, Onur M, Gürkan K, Çelik Ö, Ümran DT. Enuresis nocturna seen in the primary school children, and its evaluation based on sociodemographic data. *Çocuk ve Gençlik Ruh Sağlığı Dergisi* 2006;13:49-53.
14. Akman RY, Çam HK, Şenel F, Erol A. Prevalence of enuresis nocturna in primary school children in Düzce. *Turkish Journal of Urology* 2001;27:179-83.
15. Oge O, Kocak I, Gemalmaz H. Enuresis: point prevalence and associated factors among Turkish children. *Türk Arch Ped* 2001;43:38-43.
16. Ozden C, Ozdal OL, Altinova S, Oguzulgen I, Urgancioglu G, Memis A. Prevalence and associated factors of enuresis in Turkish children. *Int Braz J Urol* 2007;33:216-22. [\[CrossRef\]](#)
17. Çarman KB, Bıçakçı Z, Palancı Y, Alp R. Prevalence of enuresis nocturna in school children in the city of Kars, and perspectives of parents on enuresis nocturna. *Türkiye Klinikleri J Pediatr* 2008;17:103-9.
18. Gunes A, Gunes G, Acik Y, Akilli A. The epidemiology and factors associated with nocturnal enuresis among boarding and

- daytime school children in southeast of Turkey: a cross sectional study. *BMC Public Health* 2009;22:357. [\[CrossRef\]](#)
19. Kahriman İ, Mumcu HK. Frequency of enuresis nocturna, and influential factors in the children aged 7-12 years. *Sürekli Tıp Eğitimi Dergisi* 2011;20:195-201.
 20. Yıldız M, Yakıncı C. Demographic characteristics of enuretic children in the city of Malatya, and familial inheritance. *Çocuk ve Gençlik Ruh Sağlığı Dergisi* 1997;4:92-6.
 21. Koc I. Prevalence and sociodemographic correlates of consanguineous marriages in Turkey. *J Biosoc Sci* 2008;40:137-48. [\[CrossRef\]](#)
 22. Serel TA, Akhan G, Koyuncuoglu HR, Ozturk A, Dogruer K, Unal S, et al. Epidemiology of enuresis in turkish children. *Scand J Urol Nephrol* 1997;31:537-9. [\[CrossRef\]](#)
 23. Erdogan A, Akkurt H, Boettjer NK, Yurtseven E, Can G, Kiran S. Prevalence and behavioural correlates of enuresis in young children. *J Paediatr Child Health* 2008;44:297-301. [\[CrossRef\]](#)