

The Importance of Obesity and Socio-demographic Properties in Children with Nocturnal Enuresis Diagnosis

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Abstract

Introduction: Urinary incontinence during sleeping is a common condition in children older than four years. This is called nocturnal enuresis. In this study, we aimed to evaluate the sociodemographic characteristics of children with nocturnal enuresis and its relationships with etiology, diagnosis, treatment, and obesity. **Materials and Methods:** 692 patients diagnosed with primary nocturnal enuresis were screened retrospectively and included in the study. Their families were interviewed and asked to fill out the questionnaire form. This questionnaire form contained questions about gender, family history of nocturnal enuresis, frequency of nocturnal enuresis, presence of encopresis or constipation, monthly income, number of siblings, age at initiation of toilet training, sleep assessment, history of previous treatment, and perspective of families on their children's medication use, height, and weight. The relationship of these variables with nocturnal enuresis was evaluated. **Findings:** Of the 692 patients included in the study, 262 (37.8%) were female and 430 (62.2%) were male. The mean age was 9.2 (5-16) years. 112 (16.1%) patients had a family history of nocturnal enuresis. 241 (34.9%) patients wet the bed every day, 341 (49.3%) patients wet the bed two or three days per week, 62 (8.9%) patients wet the bed one day per week or less, and 48 (6.9%) wet the bed one day per month or less. While 96 (13.8%) patients had accompanying chronic constipation, 13 (1.8%) patients had accompanying encopresis. The families of 386 (55.8%) patients had a monthly income of less than 1000 TL, the families of 214 (30.9%) patients had a monthly income between 1000-2000 TL, and the families of 92 (13.3%) patients had a monthly income of 2000 TL or over. When the number of siblings in the family was examined, 52 (7.6%) patients had no siblings, 394 (56.9%) patients had 4 or more siblings. When age at initiation of toilet training was examined, 534 (73.9%) patients received toilet training between the ages of 2 and 5 years. According to sleep assessment, 360 (52.1%) patients slept deeply. 338 (48.8%) patients received previous treatment. While the families of 358 (51.7%) patients took a positive approach to medication initiation, the families of 334 (48.3%) patients were hesitant to medication initiation due to medication side effects. According to body mass index (BMI) category, 262 (37.9%) patients were lean, 364 (52.7%) patients were normal weight, 42 (6%) patients were overweight, and 24 (3.4%) patients were obese. **Conclusion:** Nocturnal enuresis is an important health problem that adversely affects children. In order to solve this problem, it is necessary to raise family awareness about nocturnal enuresis, to assess the socioeconomic status of the family, to determine whether there is a genetic predisposition in the family, and to reveal the presence of additional diseases in the child. The family should be adequately informed about the treatment. It should be explained to the family that nocturnal enuresis should be followed up. We think that there is a need for further studies on this subject.

Keywords: Child; Nocturnal enuresis; Socio-demographic characteristic; Obesity

Introduction

Urinary incontinence during sleeping is a common condition in children older than four years. This is called nocturnal enuresis.^[1-3] There have been many studies on this subject in our country. Studies have reported that the incidence of nocturnal enuresis in our country is 12.4-13%.^[4] Primary nocturnal enuresis (PNE) is defined as persistent bedwetting after toilet training. These children with nocturnal enuresis have no lower urinary tract symptoms and bladder dysfunction except for nighttime bedwetting.^[5,6] Many factors are held responsible in etiology. These factors include genetic predisposition, sleep disorders, delay in neuromotor development, dysfunction of the bladder, and irregularity in the rhythmic release of antidiuretic hormone (ADH).^[7-11] It has been observed that in some of the children with nocturnal enuresis diagnosis, ADH that has an increased secretion in the night,

has not been released sufficiently. Therefore, this inadequacy causes an increase in urine volume. When the amount of urine at night exceeds the bladder's capacity, it leads to nocturnal enuresis. Nocturnal enuresis and obesity association and importance of socio-demographic properties on the diagnosis and treatment of nocturnal enuresis has been emphasized in many studies.^[12-14]

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In this study, we aimed to evaluate the socio-demographic characteristics of children with nocturnal enuresis and its relationships with etiology, diagnosis, treatment, and obesity.

Materials and Methods

Our work follows the principles set out in the Helsinki Declaration. (Recommendations guiding physicians in biomedical research involving human subjects. Adopted by the 18th World Medical Assembly, Helsinki, Finland, June 1964, amended by the 29th World Medical Assembly, Tokyo, Japan, October 1975, the 35th World Medical Assembly, Venice, Italy, October 1983, and the 41st World Medical Assembly, Hong Kong, September 1989).

We declare that the article has been approved by the appropriate ethical committees of the institution (s) in which the study was conducted and that the subjects have voluntarily endorsed the work. Patients, who were diagnosed with nocturnal enuresis in our clinic between January 2015-May 2018 (Turkey-Malatya Education and Research Hospital, Urology Department) were included in the study. Records of 692 patients who were diagnosed with primary nocturnal enuresis were scanned retrospectively and interviews were conducted with their families in order to complete the questionnaire form. Their families were interviewed and asked to fill out the questionnaire form. This questionnaire form contained questions about gender, family history of nocturnal enuresis, frequency of nocturnal enuresis, presence of

encopresis or constipation, monthly income, number of siblings, age at initiation of toilet training, sleep assessment, history of previous treatment, and perspective of families on their children's medication use, height, and weight. The relationship of these variables with nocturnal enuresis was evaluated.

Results

Of the 692 patients included in the study, 262 (37.8%) were female and 430 (62.2%) were male. The mean age was 9.2 (5-16) years. 112 (16.1%) patients had a family history of nocturnal enuresis. 241 (34.9%) patients wet the bed every day, 341 (49.3%) patients wet the bed two or three days per week, 62 (8.9%) patients wet the bed one day per week or less, and 48 (6.9%) wet the bed one day per month or less. While 96 (13.8%) patients had accompanying chronic constipation, 13 (1.8%) patients had accompanying encopresis. The families of 386 (55.8%) patients had a monthly income of less than 1000 TL, the families of 214 (30.9%) patients had a monthly income between 1000-2000 TL, and the families of 92 (13.3%) patients had a monthly income of 2000 TL or over. When the number of siblings in the family was examined, 52 (7.6%) patients had no siblings, 246 (35.5%) patients had 1-3 siblings, and 394 (56.9%) patients had 4 or more siblings. When age at initiation of toilet training was examined, 534 (73.9%) patients received toilet training between the ages of 2 and 5 years and 158 (26.1%) patients received toilet after the age of 5 years. According to sleep assessment, 138 (19.9%) patients slept lightly, 194 (28%) patients slept normally, and 360 (52.1%) patients slept deeply. 338 (48.8%) patients received previous treatment. Of these patients, 39 (11.6%) were woken up at night, 91 (26.9%) were advised to restrict fluid intake, 145 (42.9%) received pharmacotherapy, 38 (11.2%) received psychotherapy, and 25 (7.4%) used multiple treatment modalities. While the families of 358 (51.7%) patients took a positive approach to medication initiation, the families of 334 (48.3%) patients were hesitant to medication initiation due to medication side effects. According to body mass index (BMI) category, 262 (37.9%) patients were lean, 364 (52.7%) patients were normal weight, 42 (6%) patients were overweight, and 24 (3.4%) patients were obese [Table 1].

Discussion

Although nocturnal enuresis is commonly seen in children, it needs to be treated and may cause psychological problems if not treated. The etiology of nocturnal enuresis is still unclear. Factors effecting the etiology include family history, psychological and environmental factors, sleep disorders, neurological and hormonal disorders, bladder-related pathologies, sleep disorders and ADH release disorders.^[15] Studies have reported that the incidence of nocturnal enuresis is higher in male children than in female children.^[16-18] In the study conducted by Serel et al. enuresis prevalence is found to be 14.3% in males and 7.6% in females, whereas in the study conducted by Gümüş et al. prevalence was 16.9% in males and 10.6% in females.^[19,20] Gür et al. reported that there was no significant relationship between gender and prevalence of nocturnal enuresis.^[4,21] In accordance with the literature, our study found that the incidence of nocturnal enuresis was higher in male children than in female children.

There are studies that indicate the frequency of prevalence of enuresis among children with parents who have enuresis, varies between 43% and 77% compared to normal children.^[20,21] In the study conducted by Gontard et al. this rate was found to be 63.2%, however in another study 40.7% of enuretic children had a family history; this rate was reported to be 9.5% in non-enuretic cases.^[22] In our study, 15.1% of the patients had a family history of nocturnal enuresis.

During the literature survey, the number of individuals and siblings in the family were found to be directly related to enuresis. In a study comparing families with 4 and more children to families with less than 4 children increase in the number of siblings were found to be

Table 1: Socio-demographic characteristics of children with enuresis nocturna.

Patient characteristics		n (%)
Gender	Female	262 (37.8%)
	Male	430 (62.2%)
The mean age		9.2 years
Family history		112 (16.1%)
Frequency of enuresis	Every day	241 (34.9%)
	Two or three days per week	341 (49.3%)
	One day per week or less	62 (8.9%)
	One day per month or less	48 (6.9%)
Accompanying finding	Chronic constipation	96 (13.8%)
	Encopresis	13 (1.8%)
Monthly income	<1000 TL	386 (55.8%)
	1000-2000 TL	214 (30.9%)
	>2000 TL	92 (13.3%)
Number of siblings	0	52 (7.6%)
	1-3	246 (35.5%)
	≥4	(56.9%)
When age at initiation of toilet training	2-5 age	534 (73.9%)
	>5 age	158 (26.1%)
Sleep assessment	Slept lightly	138 (19.9%)
	Slept normally	194 (28%)
	Slept deeply	360 (52.1%)
Previous treatment	Wake up at night	39 (11.6%)
	Evening fluid intake restriction	91 (26.9%)
	Pharmacotherapy	145 (42.9%)
	Psychotherapy	38 (11.2%)
Parental approach to drug treatment	Multiple treatment modalities	25 (7.4%)
	Positive	358 (51.7%)
	Negative	334 (48.3%)
Body mass index (BMI) category	Weak	262 (37.9%)
	Normal weight	364 (52.7%)
	Overweight	42 (6%)
	Obese	24 (3.4%)

related to the increase in the frequency of enuresis.^[4,17] Safarinejad et al. showed that there was a significant relationship between the number of individuals in the family and the frequency of nocturnal enuresis.^[23] In our study, a linear relationship was found between the number of siblings and individuals in the family and the frequency of nocturnal enuresis.

An inverse relationship between nocturnal enuresis and socioeconomic level can be clearly seen. Cher et al. have demonstrated that low socioeconomic level is a risk factor for nocturnal enuresis.^[24] In a multi-center study conducted in Italy by Chiozza et al., it was reported that low socioeconomic level led to an increase in the incidence of nocturnal enuresis.^[17] In our study, it was found that the frequency of nocturnal enuresis was higher in children with lower socioeconomic status.

Involuntary bladder contractions before the age of 2 years become voluntary after 2. Nocturnal enuresis is more frequently seen in children who start toilet training in the early years.^[25] In our study, it was observed that nocturnal enuresis was more common in children who began toilet training at an earlier age compared to children who began toilet training at a later age. When literature is examined, nocturnal enuresis and many diseases are seen together. The most common accompanying diseases are chronic constipation and attention-deficit/hyperactivity disorder.^[26,27] In our study, 96 patients had accompanying chronic constipation and 13 patients had accompanying encopresis.

Sleep disorders also play a role in the etiology of nocturnal enuresis. However, in a study in which children were assessed using sleep electroencephalograms, it was seen that there were no significant changes.^[28,29] Wille demonstrated that 71% of enuretic children had a heavy sleep and 7% of non-enuretic children had a heavy sleep.^[30] In our study, it was determined that 338 (53.4%) patients slept deeply.

The main treatment for nocturnal enuresis is the combination of behavioral therapy and alarm therapy. In some cases, medications may be given alone or in addition to these treatments.^[14,31-33] The referral rate to the physician for the treatment of nocturnal enuresis was found to be 17.2% in the study conducted in Ankara by Özden et al., 20.8% in another study conducted in Istanbul, and 33% in the study conducted in Mersin by Bozlu et al.^[34-36] While this rate is 28% in the studies performed in the United States and Ireland, it reaches 48% in the studies performed in New Zealand.^[18] In our study, 338 (48.8%) patients had been previously admitted to the physician. While 358 (51.7%) families had positive, in 334 (48.3%) patients it was seen that the family was hesitant to start medication due to the side effects.

There are many studies showing that there is a relationship between obesity, incontinence, and nocturia in adults. Studies have found evidence that high body mass index increases intraabdominal and intravesical pressures.^[37,38] There are not enough studies on this subject in children.^[39-41] Weintraub et al. reported that obese children were more likely to have nocturnal enuresis compared to normal children.^[42] In another study involving 281 children and adolescents, it was shown that the rate of nocturnal enuresis was 6 times higher in obese children than in normal-weight children.^[42] To the contrary of these studies, no significant difference was observed between the patient and control group in terms of obesity, in studies conducted by Aksoy et al.^[31] In our study, it was found that nocturnal enuresis was more common in lean and normal-weight children than in overweight and obese children.

Conclusion

Nocturnal enuresis is an important health problem that adversely affects children. In order to solve this problem, it is necessary to raise family awareness about nocturnal enuresis, to assess the socioeconomic status of the family, to determine whether there is a genetic predisposition

in the family, and to reveal the presence of additional diseases in the child. The family should be adequately informed about the treatment. It should be explained to the family that nocturnal enuresis should be followed up. We think that there is a need for further studies on this subject.

Conflict of Interest

The authors disclose that they have no conflicts of interest.

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