Familial Nocturnal Enuresis: No Difference on Treatment Effectiveness

Ailesel Enürezis Nokturna: Tedavi Etkinliğinde Farklılık Yok

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ABSTRACT

Although Nocturnal enuresis (NE) is closely associated with positive family history, clinical features of familial NE and effect of family history to treatment response are not well known. Aim of the study is to evaluate the effect of familial nocturnal enuresis (NE) to treatment response.

This is a prospective, descriptive, questionnaire-based cross sectional study. 117 patients admitted to pediatric surgery clinics for NE and 150 healthy subjects are included to the study randomly. Questionnaire including demographic features, educational status of parents, history of urinary tract infections (UTI), time of toilet training, family history was performed. Patients with NE with/without family history were compared for treatment features and response to treatment.

Median age; 8 years (7-9 years) in both groups. Female/male ratio was 52/65 in NE (n:117), 63/87 in healthy subjects (HS) (n:150). Mothers-fathers having higher educational level ratio was significantly higher in HS compared to NE ($p<0.05$). 40.2% of NE had positive family history, 12% of HS had positive family history of NE ($p<0.05$). Percentage of relatives of NE stopped enuresis after 6 years of age was significantly higher than in HS. No difference was detected between familial (n: 46) and non-familial (n: 71) NE for all parameters. After 2 months-treatment period, 23,4% of familial NE cases' parents found supportive treatment effective, 27,2% found medical treatment effective. Same ratios were 14,3%, 9,9% in non-familial NE cases respectively ($p>0.05$).

Positive family history is more common in NE than HS. Parents' educational status was significantly lower and age of toilet training was later in NE than HS. There is no difference between familial and non-familial NE cases regarding to treatment effectiveness.

Keywords: *Nocturnal enuresis; familial; treatment effectiveness; questionnaire*

ÖZET

Enürezis nokturnası (EN) olan çocuklarda aile öyküsüne çok sık rastlanmakta ama bu olguların klinik özellikleri, aile öyküsünün tedavi etkinliğine etkisi bilinmemektedir. Ailesel EN olgularının demografik, klinik özelliklerini incelemek ve aile hikâyesinin tedavi etkinliğine olan etkisini değerlendirmek için prospektif bir çalışma planlanmıştır.

Bu çalışma prospektif, tanımlayıcı ve anket bazlı bir çalışmadır. Çalışmaya EN nedeniyle kliniğimizde takip edilen 117 olgu ve EN şikâyeti olmayan 150 sağlıklı çocuk dâhil edilmiştir. Çalışmaya alınan tüm olguların demografik özellikleri, aile eğitim düzeyleri, tuvalet eğitimi zamanı, idrar yolu enfeksiyonu öyküsü, ailede EN öyküsünü ölçmeyi amaçlayan anket yapılmıştır. EN'li olgular içinde aile hikâyesi olan ve olmayan hastalar tedavi açısından karşılaştırılmıştır.

Olguların yaş ortancası EN'li (n:117) ve sağlıklı çocuklarda (n:150) 8 yaştır (7-9 yaş) ($p>0.05$). Kız/erkek oranı EN grubunda 52/65, sağlıklı çocuklarda 63/87'dir. Aile eğitim düzeyleri karşılaştırıldığında, yüksek eğitim gören anne, baba oranlarının sağlıklı çocuklarda EN'si olan olgulara oranla daha fazla olduğu izlenmiştir ($p<0.05$). EN'li olguların %40,2'inde aile öyküsü varken, sağlam çocukların ailelerinde EN öyküsü %12,4'dür ($p<0.05$). EN öyküsü olan aile bireylerinden gece altını ıslatmayı 6 yaşından sonra bırakanlar EN'li olguların %27,6'sını oluştururken, sağlıklı çocuklarda bu oran %6,7'dir ($p<0.05$). Aile öyküsü olan (n:46) ve olmayan EN'li (n:71) olgular karşılaştırıldığında, tüm parametreler bakımından fark gözlenmemiştir. Tedavi etkinliği karşılaştırıldığında 2 aylık tedavi sonucu ailesel olgularda destek tedavisi %23,4, ilaç tedavisi %27,2 olguda etkin bulunmuşken bu oranlar ailesel olmayan olgularda sırasıyla %14,8, %9,9'dur. Her iki grup arasında istatistiksel fark bulunmamaktadır ($p>0.05$).

EN'li olgularda aile öyküsü sağlıklı çocuklara oranla daha sık gözlenmektedir. EN öyküsü olan çocukların aile eğitim düzeyi sağlıklı çocukların ailelerine göre daha düşük, tuvalet eğitim zamanları ise daha geçtir. Aile öyküsü olan ve olmayan çocuklar arasında fark bulunmamaktadır. Aileler tarafından değerlendirilen tedavi etkinliği aile öyküsü olan ve olmayan hastalar arasında fark göstermemektedir.

Anahtar Kelimeler: *Enürezis nokturna, ailesel, tedavi etkinliği, anket*

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INTRODUCTION

Nocturnal enuresis (NE) is a well-defined common problem of childhood especially after 5 years of age. According to the 'International Children's Continence Society' definitions NE is described as intermittent incontinence while sleeping (1, 2). Enuresis can be categorized into primary or secondary NE, and monosymptomatic or non-monosymptomatic enuresis (2, 3).

The etiology of enuresis is multifactorial. Some conditions such as genetic factors sleep disturbances, bladder dysfunction, maturation delay, nocturnal polyuria play role in pathophysiology of enuresis (2, 3). Many studies reveal that family history, maturation delay and educational level of parents are closely related with frequency of NE (2-4).

Although the spontaneous resolution rate of nocturnal enuresis is 15%, emotional distress in affected children and their parents require prompt treatment (3, 5). The methods of management are behavioral management, alarm therapy, and medical treatment. However, none of these methods have been proved to be better than the other (3). It is mostly thought that some genetic factors play role in response to treatment, but the mechanism leading to this is not well clarified.

Although NE is closely associated with positive family history, clinical features of familial NE and effect of family history to treatment response are not well known. A prospective study was performed to evaluate features of familial NE cases and effect of family history to treatment response by comparing to healthy children.

PATIENTS AND METHODS

The study was performed in adherence to the Declaration of Helsinki and by approval of the Ethics Committee of Kırıkkale University (10.05.2012–12/54).

A prospective, descriptive, and questionnaire based cross sectional study was conducted. Patients admitted to pediatric surgery clinics for NE are included randomly. The patients who have been followed-up for NE in our clinic, and healthy children were involved in the study. A questionnaire including demographic features of children, educational status of parents, history of urinary tract infections (UTI), time of toilet training, family history of NE was performed to all subjects. The questionnaire was filled by a face-to-face interview. The patients with monosymptomatic NE were also wanted to answer the questions related to the treatment features and the effectiveness of the treatment after 2 months-follow-up. The patients who admitted to our clinics were treated by behavioral interventions, alarm therapy or drugs, mainly desmopressin. The parents were asked whether they had supportive and behavioral management alone or had alarm therapy and drugs. The patients with NE with and without family history were compared for treatment features and response to treatment. The treatment effectiveness was surveyed with 5-linked Likert scale (6). The parents were asked to give a point from 1 to 5 for the treatment effectiveness. These points were indicating that 1 was non-effective, 2 was 25% decreasement in number of wet nights, 3 was 50% decreasement in number of wet nights, 4 was 75% decreasement in number of wet nights and 5 was perfectly effective. The scales 1-3 were accepted as non-effective and the scale 4 and 5 were accepted as effective.

Statistical analyses were carried out using Statistical Package for Social Sciences with non parametric Kruskal Wallis test. The p values lower than 0.05 were considered as significant.

RESULTS

In the first step, the demographic features of the enuretics and healthy subjects were compared (Table 1). Median age of patients was 8 years (7-9 years) in both NE (n: 117), healthy subject (n: 150) groups. The female/male ratio was 52/65 in patients with NE and 63/87 in healthy subjects. The mothers and fathers having higher educational level ratio was significantly higher in healthy children when compared to NE group (mother-father education ratio; 18,6%, 41,3%; 15%, 31%, respectively) ($p<0.05$). The toilet training after 6 years of age was seen in 6,8% (n: 8) of patients with NE, and in 5,3% (n: 8) of healthy subjects ($p>0.05$). The history of urinary tract infection was present in 36% (n: 42) of patients with NE, and 26,7% (n: 40) of healthy subjects ($p>0.05$).

Table 1: The demographic features of the enuretics and healthy subjects.

	NE (N=117)	Control (N=150)	p value
Median of age	8 (7-9)	8 (7-9)	>0.05
Sex (M:F)	65:52	87:63	>0.05
Mother with high education ratio	18 (15%)	28 (18,6%)	<0.05
Father with high education ratio	36 (31%)	62 (41,3%)	<0.05
Toilet training time (>6 years)	8 (6,8%)	8 (5,3%)	>0.05
History of UTI	42 (36%)	40 (26,7%)	>0.05
Family history	47 (40,2%)	18 (12,0%)	<0.05
1st degree family member with NE	29 (24,8%)	12 (8%)	<0.05
Toilet training time of family member with NE (>6 years)	32 (27,6%)	10 (6,7%)	<0.05

The positive family history was encountered in 40,2% (n: 47) of children with NE. Also, 12% (n: 18) of healthy children had a family member with a history of NE. Children with NE had higher incidence of familial cases when compared to healthy children ($p<0.05$). The percentage of relatives of NE cases stopped enuresis after 6 years of age was significantly higher than relatives in healthy subjects group (27,6% vs 6,7%, $p<0.05$) (Figure 1). NE history was positive in first-degree relatives in 24,8% of NE group, and in 8% of health subjects. It was shown that NE was also seen in second and more degree relatives of NE.

Secondly, familial and non-familial NE patients were evaluated (Table 2). When familial (n: 46) and non-familial (n: 71) NE patients were compared, no difference was detected between groups for all parameters. The 92,9% of patients with non-familial NE were managed with supportive treatment, and 15,4% of them were managed with medical treatment. The same ratios for familial NE cases were 91,4% and 27,6%, respectively ($p>0.05$). At the end of 2 months treatment period, 23,4% of familial NE cases found supportive treatment effective, whereas 6,5% of them found medical treatment effective. Same ratios were 14,3%, and 1,4% in non-familial NE cases respectively (Table 2). There was no statistical difference for treatment effectiveness ($p>0.05$) between familial and non-familial cases (Figure 2).

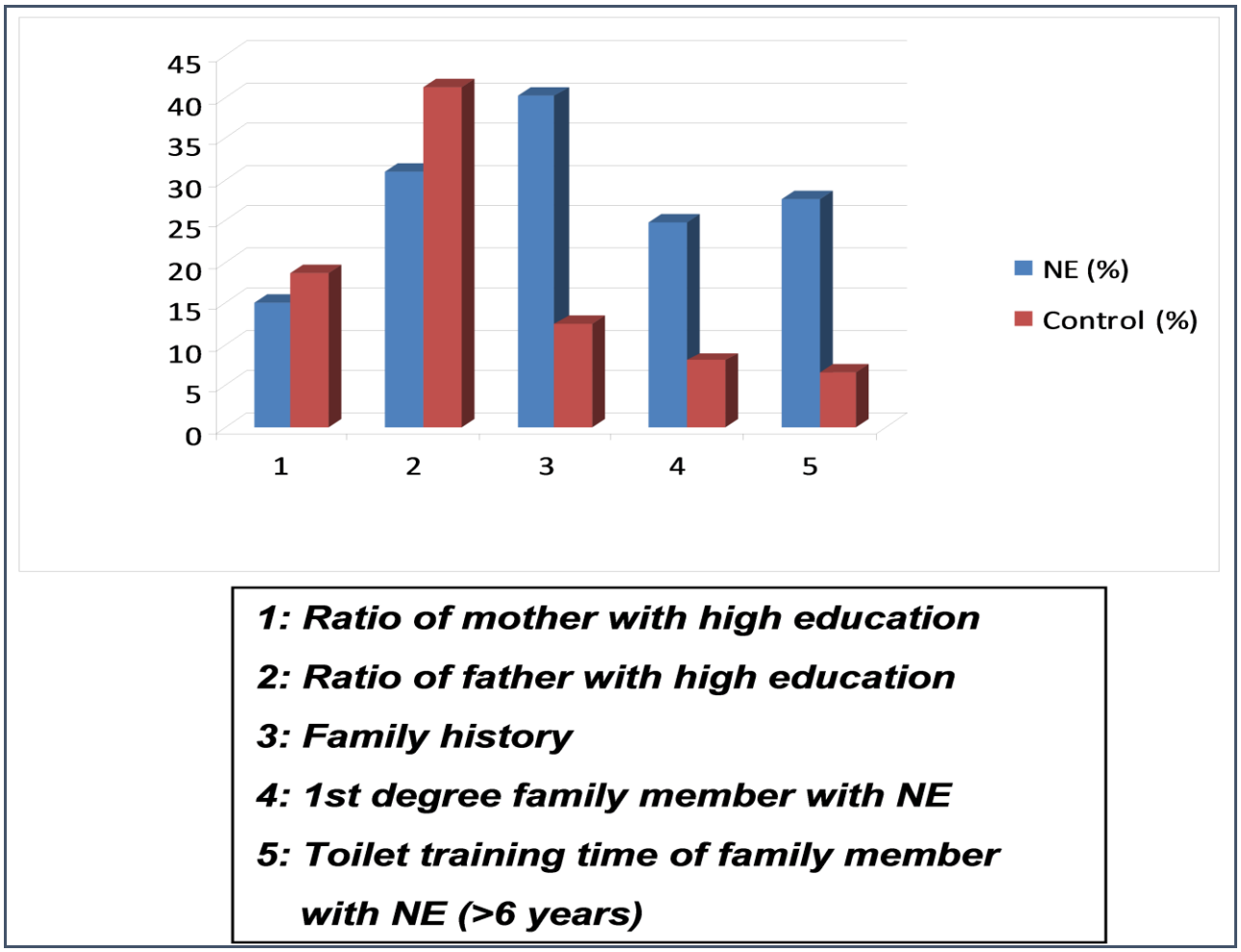

Figure 1: The comparison of the enuretics and healthy subjects.

Table 2: The comparison of familial and non-familial NE patients.

NE (N=117)	Family History (+) (N= 46)	Family History (-) (N=71)	p value
Median of age	8 ([7-9])	8 ([7-9])	>0.05
Sex (M:F)	22:24	44:27	>0.05
Mother with high education ratio	7 (15,2%)	13 (18,3%)	>0.05
Father with high education ratio	12 (26,1%)	24 (33,9%)	>0.05
Toilet training time (>6 years)	1 (2,2%)	4 (5,6%)	>0.05
History of UTI	17 (37%)	26 (39,4%)	>0.05
Treatment methods			
Supportive	43 (91,4%)	66 (92,9%)	>0.05
Alarm	2 (4,5%)	2 (2,8%)	>0.05
Drugs	13 (27,6%)	11 (15,4%)	>0.05
Effectiveness of treatment (tx)			
Ratio of effective supportive tx	11 (23,4%)	10 (14,3%)	>0.05
Ratio of effective alarm tx	0 (0%)	0 (0%)	>0.05
Ratio of effective drug tx	3 (6,5%)	1 (1,4%)	>0.05

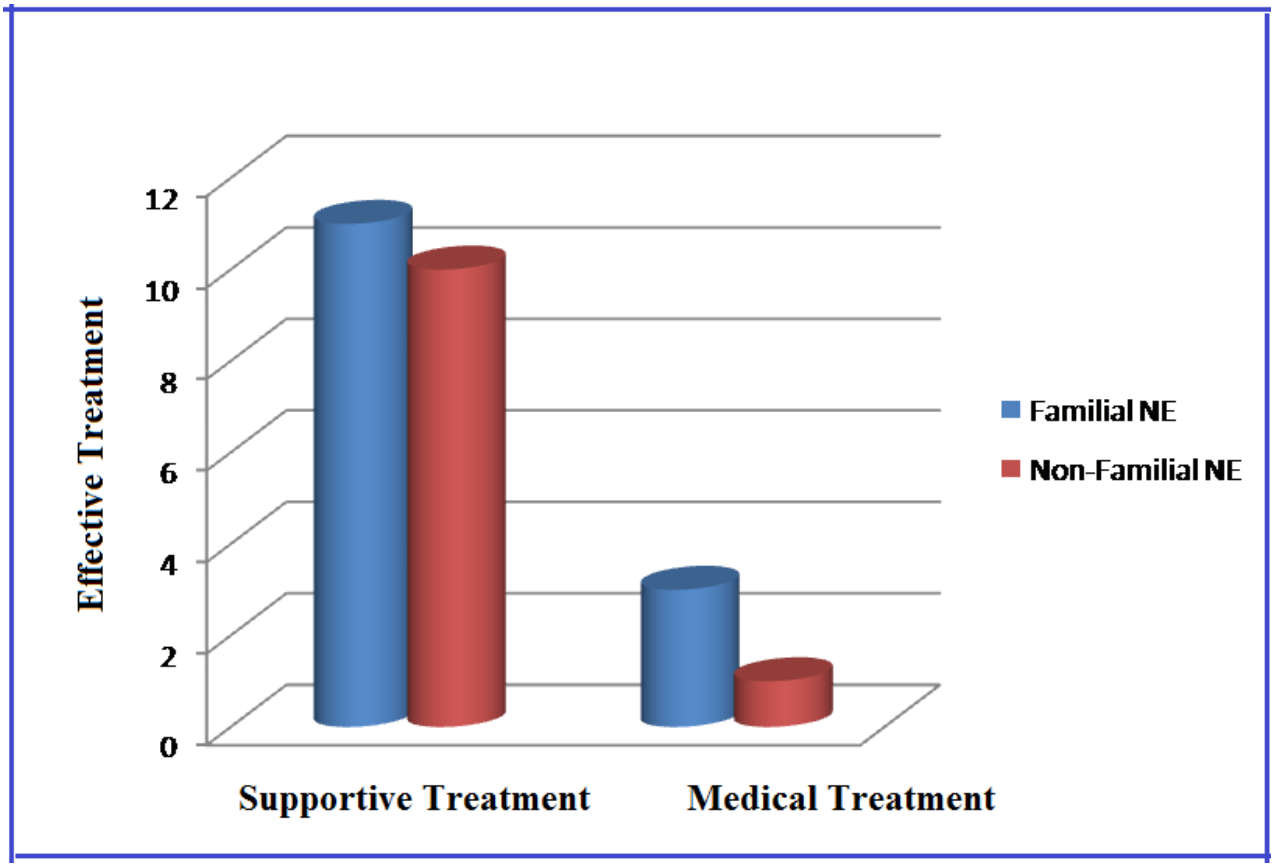

Figure 2: The comparison of familial and non-familial NE who indicated treatment effectiveness as effective (Likert scale > 3) ($p>0.05$).

DISCUSSION

Nocturnal enuresis (NE) is a common problem causing shame and embarrassment and affecting both child's and his family's life socially and behaviorally (3, 5). Several studies are present in the literature regarding the prevalence of NE, the etiologies, associated features and genetic factors. The 'International Children's Continence Society' standardized the terminology, evaluation and treatment of enuresis (1, 7). However, there are some challenging issues still exists regarding to the associated features and effects of these features to the effectiveness of treatment. The present study was designed to evaluate clinical features of familial NE and effect of family history to treatment response. The importance of our study is that the questionnaires were filled in a face-to-face interview and perception of families about effectiveness of treatment was asked after 2 months-follow-up.

There exist many studies revealing that family history, maturation delay and educational level of parents are closely related with frequency of NE (2-4). A study from Turkey revealed that low socioeconomic status of families is more commonly seen in children with NE (5). However, education levels of parents were not evaluated in that study. Gunes et al reported that NE was common in children with low income but education level of parents is not an associated factor for NE (4). However, another study revealed that there is a significant relationship between education level of parents and enuresis (8). In the same study, a significant relationship between history of urinary tract infection and enuresis was also found (8). In our study,

we found that parents' educational status, especially having higher educational level, was significantly higher in healthy children when compared to NE group. However, no relationship between NE and history of urinary tract infection was defined in our study.

Another issue associating the enuresis is maturational delay (3). Nocturnal bladder control is also heritable (3, 9). Fergusson et al revealed that children with family history of NE have a 1,5 years delayed bladder control (10). Our results showed that there was no significant difference in toilet training time between the patients with NE and healthy subjects. Interestingly, the family member with history of NE had delayed toilet training in NE group when compared to healthy subject group.

Since familial nature of NE was well recognized, the inheritance pattern, hereditary phenotypic features and clinical consequences of hereditary features have been studied in detailed for years (11). All of these studies concluded that genetic influences on NE are heterogeneous and complex (3). The history of enuresis in parents increase the risk of NE (2-4, 8, 9), but the affect of familial nature on outcome is contradictory. Wang et al showed that patients with familial nature are more likely to have severe symptoms (12). However, that study also did not survey the effect of familial history on treatment response. Schaumburg et al showed that clinical phenotype in different families seemed to differ regarding to response to desmopressin therapy (11). Unfortunately, it was not possible to show a relationship between family history and response to desmopressin in that study (13).

In the present study, the ratio of having a family member with history of NE was significantly higher in NE group than in healthy subject group. We can conclude that it is a high possibility that the child may experience nocturnal enuresis if there is a family member with NE history. The results of our study also showed that the possibility of having NE increases if the family member with NE history is a first-degree relative. On the other hand, there was no significant difference between familial and non-familial enuretics regarding to parent's educational level, bladder maturation time and UTI history. Another important thing seen in the present study is that the choice of treatment method was chosen regardless of being familial or non-familial NE.

Our results failed to show a relationship between family history of enuresis and response to treatment. Since we evaluated the answers of parents about the results of treatment, it is difficult to have a firm conclusion about the relationship between family history and response to treatment. However, we suggest that history of familial NE did not have any impact on the effectiveness of treatment. In our study, nearly one forth of the families found NE treatment effective at the end of two months period. When we ask the parents to define the 'success in the treatment', most of them suggest that no more wet nights should be considered as the success in the treatment. However, according to the definitions of ICC, we suggest that treatment effectiveness should be higher than parents' suggestion in our study. Thus, more randomized clinical trails are needed to evaluate the effect of familial history on treatment results.

Judging from our results, since treatment effectiveness was not affected by family history, over-treatment or frequent visits for more intense follow-up are not necessary in familial type nocturnal enuresis. Additionally, the positive family history is more common in patients with NE than in healthy children. Educational status of parents in children with NE was significantly lower and age of toilet training was later. Demographic features of patients did not show any difference between familial and non-familial NE cases. The effect of treatment was not different in cases with familial NE and without familial cases.

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