Investigating the Prevalence and Risk Factors of Nocturnal Enuresis among Children attending a Kindergarten in Ankara.

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Özet

Ankara'da bir Anaokulunda Yatağını Islatma (Nocturnal Enuresis) Sıklığının ve Risk Faktörlerinin Araştırılması

Bu çalışmada yatağını ıslatma prevelansı, risk faktörleri ve etkileyen etmenlerin özellikle de parazitoz ile aralarındaki ilişkinin araştırılması amaçlanmıştır. Bu tanımlayıcı çalışmanın evrenini MEB (Milli Eğitim Bakanlığı)'na bağlı Ankara ili Keçiören bölgesinde bulunan bir anaokulu oluşturmaktadır, Öğrenci velilerine, anaokulu idaresi aracılığıyla; anket formu, araştırmaya ait rıza formu, Enterobius Vermiculares araştırmasında kullanılmak üzere kendinden selofan bantlı lamel ve dışkı numune kabı dağıtılmıştır. Araştırmamızda kullanılan anket formları araştırmacılar tarafından literatür bilgileri taranıp derlenerek hazırlanmıştır. Alınan dışkı ve selofan bant numuneleri Parazitoloji Bilim Dalı tarafından tüm parazitler yönünden incelenmiştir. Sonuçlar SPSS 15 paket programına aktarılarak, analizler gerçekleştirilmiştir. Araştırmaya 311 anaokulu öğrencisi katılmıştır. Çalışmaya katılan öğrenciden ikisinde parazitoz saptanırken 55 öğrencide yatağını ıslatma olduğu tespit edilmiştir. Araştırmaya katılan öğrencilerin annelerinin 31'i (%10,0), babalarının 39'u (%13,0) çocukluk döneminde yatağını ıslatma yaşadıkları bildirilmiştir. Çalışmaya katılan öğrenciler arasındaki yatağını ıslatma sıklığı diğer çalışmalarla benzerlik göstermiş, buna karşılık parazit pozitifliği yok sayılabilecek düzeyde bulunmuştur. Parazit pozitifliğinin azalmasına karşın yatağını ıslatma sıklığının aynı düzeyde devam ediyor olması nedeniyle her iki durum arasında birlikteliğin olmadığı sonucuna varılmıştır.

Anahtar Kelimeler: Barsak paraziti, Anaokulu, Gece yatağını ıslatma,

Abstract

The goal of this study is, find out the prevalence of nocturnal enuresis and to determine the associated risk factors by giving special consideration to the parasitic infections.. Population of present descriptive study study was consisted of a kindergarten affiliated to MEB located at Keçiören region, Ankara province. Questionnaires used in our study are prepared by researchers following search and compilation of literature content. Parents of students were delivered, via administration of kindergarten, a questionnaire form, a consent-to-study form and self-adhesive slide and feces container for examining Enterobius Vermiculares. Feces and cellophane tape samples were subjected to examination for all parasites by Parasitology Department. Statistical studies were performed using SPSS 15 programme. 311 students participated in the study. Parasitosis was diagnosed in two students; nocturnal enuresis was diagnosed in 55 students. Among parents of all students; 31 mothers 39 fathers lived nocturnal enuresis when they were at their children's age. A history of enuresis was found in 10.0% and 13.0% of enuretic children's mothers and fathers respectively in our study. Therefore parasite prevalence was determined low, it was concluded that etiology of nocturnal enuresis and intestinal parasitosis is different.

Key Words: Parasitic intestinal diseases, Kindergarten school, Nocturnal enuresis.

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Introduction

Nocturnal Enuresis (NE) has been described as an involuntary voiding of urine during sleep at least two times a week for three months, in the absence of congenital or acquired defects of the central nervous system or the urinary tract in a child aged 5 years or over. Nocturnal enuresis is classified as primary or secondary nocturnal enuresis. In primary nocturnal enuresis, the child has never been consistently dry at night. If the child has experienced at least 6 months of dryness at night and then begins bedwetting, the condition is referred to as secondary nocturnal enuresis. The group with primary NE constitutes 80 to 90% of all cases, and genetic predisposition, biological and growth-related issues are the main underlying factors. Researchers have consensus on familial predisposition in enuresis (1,2,3). About two billion people experienced intestinal parasitic infestations all around the world. This is a significant public health problem. Iron-deficiency anemia and growth retardation are the well known complications (4).

In different studies, significant relationship between enuresis and intestinal parasitic infections could be found (5,6) or not (7).

In this study, it is aimed to find out the prevalence of enuresis and parasitic infections, association between enuresis and intestinal parasitic infections.

Material and Method

This study consisted of all students attending a kindergarten without sampling affiliated to MEB (Ministry of Education of Turkey) located at Ankara province, Turkey. In the study period, 427 students were attending. The questionnaire was administered to 427 students. Among them, 345 (80.7%) completed the questionnaire adequately. In conclusion, considering prevalence of enuresis, totally 311 students were taken in to account. Participation to the study was similar among all classes of school. Parents of students were delivered, a questionnaire, a consent-to-study form and self-adhesive slide and feces container. Height and body weight measurements of students were performed by researchers for calculating body mass index (BMI) and students were divided into "normal and below normal" and "above normal" groups. "Body Mass Index reference values for Turkish Girls and Boys" was used as reference values. If BMI is in the range, 13.5–18.5 kg/m^2 for five years old, 13.5–18.5 kg/m^2 for six years old, 13.5–19.1 kg/m^2 for seven years old boys and 13.4–18.5 kg/m^2 for five years old, 13.3–19.1 kg/m^2 for six years old, 13.4–19.7 kg/m^2 for seven years old girls, students are considered to be normal weight (8).

Enuresis criterions were interrogated in questionnaires and children fulfilling subject criterion due to information obtained from families were regarded as NE. Feces and cellophane tape samples were subjected to examination for all parasites by Parasitology Department.

In the treatment of children with nocturnal enuresis maximum voided volume can be increased significantly through holding exercises. In order to assess the protective effect of exercises against nocturnal enuresis in children, we asked their status regarding exercises. Exercise at sports club with sportsman license was regarded as children with regular exercise (9).

Considering that capacity of urinary bladder will increase by age and it may be calculated using "ageX30ml" formula for children. Consuming 200 ml (approximately one water glass) liquid during dinner are regarded as liquid consumers above their bladder capacity. Children consuming liquid less than a water glass are regarded as liquid consumers below bladder capacity and children not consuming liquid are referred as non-consumers (10).

Breast feeding status was asked to families and children are divided, in accordance with World Health Organization, into three groups including children with breast milk less than six months, between six months and one year and longer than one year (11).

Questionnaires are prepared by researchers. Survey forms involved totally 17 questions. Our research was conducted in April 2008.

Statistical studies were performed using chi-square test via SPSS 15; p value less than 0.05 is regarded as significant and views of Açıkel and colleagues were benefited during performance of statistical studies (12).

Permissions required for present research were obtained from Ethical Committee before the study. Participants and school administrators were informed about this. Consents of families were obtained.

Results

Several demographics are shown in Table 1 Among students, there were 163 boys (52.4%) and 148 girls (47.6%). No significant difference between two genders in terms of enuresis (p=0.2). It was observed that there was a significant decrease in enuresis frequency by age (p=0.03).

Table 1. Socio-demographic features of participants and parents.

	E.Nocturna				p
Gender (n=311)	**Yes**	**%**	**No**	**%**	**0.2**
Male	33	20.2	130	79.8	
Female	22	14.9	126	85.1	
Student's Age (n=310)					
Five	37	25.7	107	74.3	0.03
Six	17	10.6	143	89.4	
Seven	1	0.0	5	100.0	
Education (Mother) (n=310)					
Primary School	6	26.1	17	73.9	0.7
Secondary School	3	15.8	16	84.2	
High School	21	16.8	104	83.2	
University	24	16.8	119	83.2	
Education (Father) (n=309)					
Primary School	6	30.0	14	70.0	0.4
Secondary School	3	11.5	23	88.5	
High School	15	16.5	76	83.5	
University	30	17.4	142	82.6	
Matrimonial Conflicts (n=311)					
Yes	3	20.0	12	80.0	0.8
No	52	17.6	244	82.4	
Mother is housewife (n=311)					
Housewife	30	22.4	104	77.6	0.04
Not	25	14.1	152	85.9	
Member of a healthcare profession (Mother) (n=309)					
Member	3	7.7	36	82.3	0.08
Not	52	18.8	220	81.2	
Member of a healthcare profession (Father) (n=311)					
Member	2	10.5	17	89.5	0.3
Not	53	19.1	239	80.9	

Considering education status of mothers, 143 (46.0%) were graduated with college degree and there was no illiterate mother. The number of fathers with college degree graduates was 172 (55.2%) and there was no illiterate. No significant difference could be found between students with and without enuresis for their parental education status (p=0.7 mother; p=0.4 father).

There was no marital conflict in 296 student families (95.2%), marital conflict was the case for 15 families (4.8%). Status of marital conflict have no significant effect on enuresis (p=0.8). Marital conflict has been determined based on the perceptions of the parents. Enuresis is more significantly frequent in children whose mothers were stated as housewife (p=0.04). Participants were also separated into two groups according to children whose mother is a healthcare profession or not. No significant difference could be found between these groups for the distribution of enuresis (p=0.08). This was repeated considering father profession, and no significant difference was found (p=0.3)

Enuresis status according to several personal and familial factors is shown in Table 2.

Table 2. Participant's bedwetting circumstance according to individual and familial features.

	E.Nocturna				p
	Yes	**%**	**No**	**%**	
Bedwetting (mother) (n=310)					
Yes	12	38.7	19	61.3	0.03
No	42	15.1	237	84.9	
Bedwetting (father) (n=300)					
Yes	18	46.2	21	53.8	<0.01
No	34	13.0	227	87.0	
Bedwetting (siblings) (n=232)					
Yes	8	30.8	18	69.2	0.02
No	28	13.6	178	86.4	
Making sports (n=296)					
Yes	4	11.1	32	88.9	0.3
No	46	17.7	214	82.3	
Drinking liquids (dinner) (n=307)					
Excess consumption	4	18.2	18	81.8	
Normal consumption	36	20.7	138	79.3	0.2
None	14	12.6	97	87.4	
Breastfeeding (n=311)					
< six months	36	16.5	182	83.5	
Six months-one year	8	17.0	39	83.0	0.4
> a year	11	23.9	35	76.1	
BMI (n=282)					
Normal or less	45	17.4	213	82.6	0.6
More than normal	5	20.8	19	79.2	

All students were examined for intestinal parasites. Only two students were diagnosed with *Giardia Lambia*, both of them were healthy regarding enuresis and it was suggested that there was no significant relation between intestinal parasitosis and enuresis. Household of students were questioned for presence of enuresis condition when they were at same age with study students (13).

The familial prevalence rates concluded that 46.2% of fathers, 38.7% of mothers, and 30.8% of siblings experienced a problem with enuresis. There was a significant difference between students' parents with and without nocturnal enuresis (p=0.03; p<0.01 and p=0.02 mother, father and sibling respectively). No significant difference could be found between students; with and without regular exercise, consuming liquid above bladder capacity, within bladder capacity and non-consumers, normal or below-normal BMI and above normal BMI (p=0.3; 0.2; 0.6 respectively). No significant difference could be found between breast feeding period and enuresis (p=0.4).

Discussion

The prevalence of NE varies considerably, between regions of Turkey; 11.5% in Isparta by Serel et al.; 13.7% in Manisa by Gümüş et al.; 11.6% in Aydın by Öge et al. By Çarman et al, enuresis prevalence

was found as 25.5 percent in Ümraniye, district of Istanbul where people of this suburban area mostly in low socio-economic level and limited access to healthcare services (14-17).

There are remarkable differences between values obtained from various regions of the world; 9.8% for girls and 13.8% for boys in China; 14.0% for boys and 9.0% for girls in Taiwan; 7.4% for boys and 5.3% for girls in Malaysia (18-20).

In our study, corresponding values were 20.2% boys and 14.9% girls. The main reason of comparatively higher prevalence of NE may source from the ages of the participants. The children in our study were aged from 5 to 7 while other studies included children from 6 to 16 (18-20).

Different results were obtained at intestinal parasite prevalence studies conducted at different regions of Turkey in recent years. Frequency of intestinal parasites is 10.8% by Koç et al, 48.0% by Saygı et al and 55.1% by Ulukanlıgil et al (21-23).

In our study, intestinal parasite prevalence was determined as low as 0.6 percent. This difference may originate from different factors; study time, region or age of children and recent developments including health services in Turkey.

There are two studies claiming, an association between enuresis and parasitic infection. In the study of Zeyrek et al determined the positivity of *Enterobius Vermicularis* eggs as 66% in children with enuresis and 28% in controls. In another study conducted at orphanage located in Antakya province in 2006, Duran et al found the prevalence of *Enterobius Vermicularis* as 71.3% and the prevalence of enuresis as 51.3% (6,7).

One of the main focuses of the present study was to determine whether this positive association claimed both studies would exist in our study population. Therefore we intended to conduct a built-in case control study within this research. But, the only two positive *Giardia Lambia* eggs did not enable us to perform this case-control study. However, despite very low rate of parasitic infections, comparatively higher rates of enuresis found in our study indicated that the given association between parasitic eggs and enuresis above may not be a causal relation. Reversibility is one of Austin Bradford-Hill criteria for determining causation (24).

It means removal of a presumed cause lead to a reduction in risk of ill health. When we take parasitic infection as a cause for enuresis, no cause is available in our study to explain the relatively higher number of children with enuresis.

The studies claimed the positive association above determined remarkably higher prevalence of parasitic infections. This higher prevalence of parasitic infection might have caused this association. On the other hand, the second one of this study carried by Duran et al. stated the prevalence of NE significantly decreased from 51.3% (41/80) to 33.8% (27/80) depending on the decrease of the prevalence of *Enterobius Vermicularis* after the mebendazole treatment ($p<0.05$). But when we looked at closely to their study they included at 4 years old children and their study lasted 6 months from March to September 2003. As mentioned above, NE can be considered for children older than 5 years old and enuresis rates decreases by age. The younger age of study participants and the time interval from first diagnosis to the second one in their study might be confounding factors that interfere with the effect of mebendozale treatment.

Of 55 individuals stating presence of enuresis among students in our research, 28 students (59%) had familial history of enuresis in at least one member of households. Results obtained from different studies conducted in our country confirmed consistently familial predisposition for enuresis as follows; it was reported that 22.2% of all cases in a study conducted by Serel et al and 40.5% of all cases in a study conducted by Öge et al had positive familial history (14,16).

In a study conducted by Özkan et al, cases with positive familial history were determined as 66 percent (25).

Çarman et al. had determined 55.9% positive familial history in their study (17).

In some studies conducted in our country, enuresis frequency was found significantly higher for boys than for girls. In our study and another study conducted by Deveci et al in Istanbul, no significant difference could be found between girls and boys (15-17,26).

It is suggested that the given difference may originate from difference between cases numbers used in different studies. The studies determined significant difference in enuresis rates between boys and girls involved higher number of participants that probably might reveal this difference.

Gümüş et al, compared enuresis rates between different groups based on breast feeding status and

they could not find a significant difference as in our study. Gümüş et al found increase in education status of mother had a significant decreasing effect on enuresis rate but in our study, no significant relation could be found (15).

In those studies conducted by Unalacak et al in 2004 and by Gümüş et al in 1999, it was found that enuresis was significantly higher in children with house-wife mother. Results obtained in our study was also similar (15,27).

Conclusion

Parasite prevalence in our study group was very low and it may be regarded as a good indicator for improvement in health level of our country. It was evaluated that enuresis has familial predisposition and enuresis is more frequently seen in children with housewife mother.

Familial predisposition was also addressed in previous studies. Higher frequency of enuresis in children with housewife mother is considered to originate from tendency of those mothers to "protective mothering" behavior pattern. It is concluded that researchers are required to examine this issue by more detailed studies.

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