

Nocturnal Enuresis and its Impact on Growth

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Abstract

Objective: Nocturnal enuresis is a common developmental-behavioral problem in children. The present study was conducted to estimate the prevalence of primary nocturnal enuresis and to determine its impact on physical growth of the first grade elementary school children.

Material & Methods: This is a cross-sectional study carried out on 350 first-grade children (6 to 6.5 yr old) elementary schools in Gonabad through random stratified sampling. All children had primary nocturnal enuresis. A questionnaire containing demographic criteria and various factors that may play a role in bed-wetting was filled out; a digital scale and a non-expanding measuring tape were used to collect data. Diagnosis of enuresis considered nocturnal voiding twice a week for at least three consecutive months.

Findings: The prevalence of primary nocturnal enuresis was 21% for boys and 14.9% for girls, and the overall prevalence was 17.5%. The average weight of enuretic children was lower than that of the non-affected ones. In addition, these children were in average shorter compared to those without enuresis.

Conclusion: This study demonstrates that growth failure is a coexisting problem in children with primary nocturnal enuresis. Since enuresis and other stressful conditions in family can cause growth failure in children, the treatment of enuresis eliminating a stressful condition could be an effective measure in improving children's physical growth.

Key Words: Nocturnal Enuresis; Prevalence; Growth Failure; Children; Primary school

Introduction

Nocturnal enuresis (also known as nighttime incontinence or bed-wetting) refers to involuntary voiding only at night beyond the age at which most children have stopped. Enuresis may be primary or secondary [1].

Children who have no prior period of sustained dryness are considered to have primary (persistent) nocturnal enuresis and the recurrence of nighttime wetting after 6 months or longer of dryness is referred to as secondary (regressive) [1,2]. Ninety percent of

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patients are primary enuretics; delayed maturation of bladder function accounts for many cases of primary nocturnal enuresis^[1]. Maturation of urinary sphincter occurs in 75% of children by age 4, and 90% by age 8^[3].

Another classification for enuresis is based on presence or absence of other symptoms and is defined as monosymptomatic (uncomplicated) nocturnal enuresis in which there are no other symptoms related to the gastrointestinal or urogenital systems, and polysymptomatic (complicated) one in which it is associated with day time symptoms such as urgency, frequency, constipation, or encopresis^[2,4].

Prevalence of nocturnal enuresis decreases with increasing age^[4-7]. It is 15% to 25% in children aged 5 yrs^[8]; at age 10 yrs it is 3% for boys and 2% for girls and at 18 yrs it is 1% for males and extremely rare in females^[1]. Six-year-old children are at increased risk of having never been dry if they have neurological abnormalities; they are middle children in birth order with poor marital adjustment of parents, and low rating in social contact^[9].

Since almost all previously conducted studies have evaluated only developmental-behavioral aspects of enuresis, the present study was performed with the aim of determining the prevalence, and relationship between primary nocturnal enuresis and growth failure in the first grade elementary school children.

Material & Methods

This study was conducted on the children selected randomly based on stratified sampling from primary school students, following approval by ethics committee of the Gonabad University and receiving consent from teachers and school managers, in Gonabad city (Khorasan Razavi Province), Iran. Then parents were asked to complete a questionnaire containing various factors that may play a role in enuresis. Validity of questionnaire was determined by Cronbach's

alpha coefficient ($\alpha=0.74$). The tools used to collect anthropometric data in this study included a digital scale and a non-expanding measuring tape, which are the standard measuring tools for height and weight. Weight was taken with bare feet and minimum clothing, height was taken in standing position with bare feet and a non-expanding measuring tape against the wall as the buttocks, back of shoulders and heels were touching the wall with head forward.

Children in the study had the following characteristics: studying in the first grade of primary school with an age range of 6 to 6.5 years, living with parents from birth, having not any systemic or congenital diseases, having no urinary tract infection and diabetes mellitus, and had criteria for primary nocturnal enuresis.

The collected data was analyzed through descriptive analysis and T-student test using SPSS package for windows. P value <0.05 was considered statistically significant.

Findings

In this study, from three hundred and fifty questionnaires which were sent out to parents, 291 (168 girls and 123 boys) were replied. Twenty-six boys (21%) and 25 girls (14.9%) and in general 51 (17.5%) of children who participated in the study had enuresis. Ninety-seven boys (78.8%) and 143 girls (85.1%) had no enuresis.

The average height and weight of girls with nocturnal enuresis compared to those without it showed a significant difference. Boys with nocturnal enuresis had lower weight and height for age compared to the healthy ones, but their average height and weight of these groups in comparison with the healthy children did not show a significant difference (Table 1).

The mean (SD) age of enuretic and healthy group was 6.2 (0.2) and 6.1 (0.2) years, respectively. There was no significant difference regarding the age among the groups ($T=0.52$, $df=289$, P . value= 0.6).

Table 1- The average height and weight of girls and boys with enuresis and those without it

Variable		Enuresis present	Enuresis not present	T	df	P value
Mean (SD) Height (cm)	girls	116.7 (5.5)	119.4 (5.6)	-2.24	166	0.03
	boys	117.0 (7.0)	118.1 (12.0)	-0.46	121	0.6
Mean (SD) Weight (Kg)	girls	19.0 (2.6)	20.7 (3.4)	-2.37	166	0.02
	boys	19.2 (2.3)	20.2 (3.1)	-1.61	121	0.1

Discussion

Enuresis is a very common problem in children, which causes embarrassment, stress, and discomfort in them and their families. Nocturnal enuresis has multiple causes. The most common acceptable etiologies for enuresis include: genetic factors, behavioral disorders, delayed maturation of central nervous system, small size of bladder, abnormal sleeping patterns, sleep apnea, hormone imbalance, stress, diabetes, chronic constipation, UTI, anatomical defects^[1,4,10]. Most children with mental age of 5 years achieve night and daytime bladder control^[1].

The prevalence of primary nocturnal bed-wetting has been reported differently in various studies. In present study, the prevalence of nocturnal enuresis in boys is higher than in girls, which is similar to the findings of other studies in this field^[4-7].

In a study in South Korea on 12570 children aged 7-12 yrs, the prevalence of nocturnal enuresis was reported 9.2%^[11]. In another study in Turkey on 7-11 year-old children, enuresis was 16.9% for boys and 10.6% for girls and in general 13.7%^[7]. In a research performed in Pakistan the prevalence of nocturnal enuresis was 9.1%^[12]. In a study carried out in 1996 in Saudi Arabia the prevalence of nocturnal enuresis among school age children was reported 15%^[13].

The prevalence of bed-wetting in our study is relatively high since the children we enrolled in the study were younger and from the first grade of primary school level (6-6.5 yr old) compared to the groups mentioned above; the lower the age of children the higher

the rate of nocturnal enuresis^[4-7]. The higher prevalence of enuresis in comparison with other studies can be a result of this age difference.

In our study, children with nocturnal enuresis had lower weight and height for age compared to the healthy ones but due to the small number of samples, the result in boy group was not significant. Other studies support our findings: A study performed in Finland in 1991 demonstrated that children with nocturnal enuresis suffered from slow growth in comparison with the control group^[14]. The findings of a research in England on people aged 7-11 and 16-23 yrs showed that there was a significant statistical difference regarding height in 7 yr-old children with nocturnal enuresis and in children without it, the height of children with enuresis in adulthood was 1 cm shorter than those without it^[15]. A research conducted in Turkey also showed significantly higher incidence of fine and gross motor abnormalities, slower linear growth and shorter stature, retarded bone age, and reduced bone mineral density in enuretic children^[16]. Another study also suggested that skeletal maturation retarded in children with nocturnal enuresis^[17].

Conclusion

This study demonstrates that growth failure is an associated problem in children with primary nocturnal enuresis. It should be taken into account that enuresis and other stressful conditions in family, regardless of other

factors, can cause growth failure [18]. Thus, the treatment of enuresis which eliminates a stressful condition could be an effective measure in improving children's physical growth and has implications for the planning of health services.

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