Frequency of Enuresis in Primary School Children in Basra and its Impact on Their Growth

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ABSTRACT—
Background: Nocturnal enuresis is common clinical problem in children. Although it is considered as a benign symptom, it causes substantial distress and presents significant psychosocial problems for children and their parents. It is now generally accepted that 15 to 20 % of children will have some degree of bed-wetting at five years of age, with a spontaneous remission rate of approximately 15 % per year. Enuresis is an important urologic problem. It may have a significant impact on the child's growth and development.

Subjects and methods: This is a cross- sectional with case control study carried out on (675) primary schools children; aged (6-7) years. Over a period of 5 months from (2nd of January 2009 till the end of May 2009).Total of (129) children with no history of bed-wetting were randomly selected as control group. A standard questionnaire was filled out for each student. The ages of the children were obtained from birth record maintained in the school; other information were obtained through a direct interview with the parents.
All enuretic children and controls were under went physical Examination to assess their height and weight.

Result: Sixty four students had NE, the overall frequency of NE was (9.48%). (53.1%) were boys and (46.9%) were girls. Family history of enuresis was reported in (57. 8%), (1.3%) of enuretic and non enuretic children respectively. The result was statistically significant, p value <0.05. Enuresis was mainly nocturnal of primary type.
Children with NE had lower body mass index (BMI), weight and height for age compare to their control group. Conclusion: Nocturnal enuresis can serve as easily noticeable indicator for delays in some spheres of child growth. Since enuresis and other stressful conditions in family can cause growth failure in children, the treatment of enuresis and eliminating stressful condition could be an effective measure in improving children's physical growth.

In this paper, we describe the submission guidelines for preparing papers for the Asian Journal of Pharmacy, Nursing and Medical Sciences (AJPNMS). Use this document as a template with Microsoft Word 6.0 or later. Define all symbols used in the abstract. Do not cite references in the abstract. The abstract body is typed in Times New Roman, 10 pt. italic and in bold face.

Keywords— enuresis, nocturnal, BMI

1. INTRODUCTION

Nocturnal enuresis also known as (nighttime incontinence or bed-wetting) which is defined as involuntary voiding of urine at least two episodes or more /week in a child aged 5years and older who should have bladder control (normally at age of 2-4 years) [1].

It is now generally accepted that 15 to 20 % of children will have some degree of bed-wetting at five years of age, with a spontaneous remission rate of approximately 15 % per year. Therefore, at 15 years of age only 1 to 2 % of teenagers will still wet their beds [2].

Enuresis is slightly more common in boys than in girls. The prevalence among children of various ages is as follows, 5 years: 16 %, 6 years: 13%, 7 years: 10 %,

8 years: 7 %, 10 years: 5 %, 12 to 14 years: 2 -3%. And ≥15 years: 1 -2%. [5]

A family history of nocturnal enuresis is found in most children with the condition. [3]

Heredity as a causative factor of primary nocturnal enuresis has been confirmed by the identification of a gene marker associated with the disorder. Recent research has found that small bladder capacity and increase urine production

may be inherited so the etiology of nocturnal enuresis is characterized by a complex interaction of genetic and environmental factors. [4]

Enuresis is an important urologic problem. It may have a significant impact on the child's growth and development. In enuretic children there is a significantly higher incidence of fine and gross motor clumsiness, delayed developmental milestones, slower and poor linear growth, and these patients are shorter than normal children. This might due to insufficient antidiuretic hormone (ADH) secretion, as well as growth hormone (GH) deficiency. [5]

Study demonstrates that; the delay of growth was recognized in a period of awakening urination; awaking urination disturbs circadian rhythm of growth hormone and other growth relating hormones and produces a delay of growth. All patients recognized catch up growth after independence of nocturnal enuresis. [6]

The aim of the study is to estimate the frequency of enuresis in 1st grade primary school children and study their demographic characteristics and some medical problems related to their bed wetting as well as assess their growth.

2. SUBJECTS AND METHODS

This is a cross- sectional with case control study carried out on (675) children of 18 primary schools; aged (6-7) years.

Students of first grade class (A) were recruited in this study aged (6- 7) years over a period of 5 months from (2nd of January 2009 till the end of May 2009)

Total of (129) children with no history of bed-wetting were randomly selected. For each enuretic child two controls were selected, those were the names in the list that are in order just before and after the enuritic child. A standard questionnaire was filled out for each student.

The ages of the children were obtained from birth record maintained in the school; other information was obtained through a direct interview with the parents. A standard questionnaire was filled out for each student included in the study. The following information was obtained: name, sex, age, type of enuresis (primary, secondary). Enuresis time (nocturnal, diurnal—nocturnal). *Enuresis frequency per week (twice, 3-5 times, every day).* Family member with enuresis (father, mother, both, siblings, other)

All enuretic children and controls were under went physical examination to asses: height, weight .Body mass index (BMI) was calculated by using the formula: BMI=weight (kg)/height (m) Anthropometric data weight, height and BMI, are applied to appropriate charts "WHO references values" in 2007 [7].

Statistical analyses through chi-square and logestic regression test were employed using SPSS soft ware.

3. RESULTS

Total of (675) primary school students were studied. Sixty four students had NE, the overall frequency of NE was (9.48%

Table [1] : Demographic Characteristics of enuretic and non enuretic children.

Variable	Enuretic Number %	Non enuretic Number %	Total	Odd ratio	P .value
Sex Boys Girls	34 (53.1) 30 (46.9)	306 (50.1) 305 (49.9)	340(50.4) 335 (49.6)	1.117 0.989	>0.05
Family history Positive Negative	37 (57.8) 27 (42.2)	8 (1.3%) 603 (98.7)	45 (6.7) 630 (93.4)	4.55 2.11	<0.05
Total	64	611	675		

Three hundred forty (50.4%) were boys and 335 (49.6%) were girls.

Table [1] illustrate demographic characteristics of enuretic and non enuretic children

Out of 64 enuretic child, 34(53.1%) were boys and 30(46.9%) were girls while non enuretic children 306 (50.1%) were boys and 305 (49.9%) were girls respectively giving non significant results .p value >0.05

All studied children were in 1st grade primary school, their ages ranged from (6-7years), the difference was statistically non significant in both enuretic and non enuretic children.

Thirty seven (57. 8%) of enuretic children had positive family history of enuresis compared with non enuretic children 8(1.3%), the result was statistically significant. p value<0.05.

4. CHARACTERISTICS OF ENURESIS

Enuresis in these children was mainly of primary type. Sixty one (95.3%) were with primary enuresis and 3(4.7%) were with secondary type.

Most of enuretic children 56 (87.5%) were with night time bed wetting and 8 (12.5%)were with day –night bed wetting .Those who wet their beds at least twice/ week has low frequency (4.7%) compared to other groups; While those who wet their beds(3–5) times/week were (51.6%) and those who daily wet their beds were (43.8%).

Table [2] Distribution of cases in relation to type of enuresis.

Enuresis		Number (%)
Type	Primary	61 (95.3)
	Secondary	3 (4.7)
Time	Nocturnal	56 (87.5)
	Diurnal – nocturnal	8 (12.5)
Frequency	2 times/week	3 (4.7)
	3-5 times/week	33 (51.6)
	Every day	28 (43.8)

5. NUTRITIONAL STATUS OF STUDIED CHILDREN USING HEIGHT, BMI/AGE PARAMETERS

Children with NE had lower BMI, weight and height for age compared to their control group as shown in Table [3]

The mean (weight, height, BMI) ± SD were (16.9 ±2.4, 108.9 ± 6.1, 14.2±1.0) for enuretic and (18.2±1, 112.7±5.1, 15.3±1.2) for control group. The result was statistically significant.

Normal height/age was reported in 18 (28.1%) and 108(83%) in enuretic and control group respectively. Enuretic children had mild and moderate stunting in 33(51.5%), 13 (20.4%) respectively.

Tall stature or increase height /age was found only in 21(16%) of control group. All figures were statistically significant, p value <0.001.

Normal nutrition was found in 37(57%) and 109 (84%) in enuretic and control group respectively, as well as mild and moderate thinness reported in 11(17%), 16(25%) of enuretic children respectively. However over weight in control group reported in 20 (15%).These figures were statistically significant. p value <0.05.

Table [3] Nutritional status of enuretic children and their control using height / age and BMI/age indicator

Variable	Enuretic			Control	
Height(cm)	Normal 18(28.3%)	Mild stunting 33(51.5%)	Moderate Stunting 13(20.2%)	Normal 108(83.6%)	Tall 21(16.4%)
Mean ±S.D		108.93±6.1959		112.72±5.143	
BMI(kg/m^2)	Normal 37(57.1%)	Mild thinness 11 (17.6%)	Moderate Thinness 16(25.3%)	Normal 109(84.7%)	Over wt 20(15.3%)
		Mean ±SD	14.2 ± 1.0 09		5.3± 1.212

6. NUTRITIONAL STATUS OF STUDIED CHILDREN ACCORDING TO AGE AND SEX

Higher frequency of mild and moderate thinness in girls than boys; account for (56%), (44%) respectively as well as 25 (93%) of children with mild and moderate thinness, mild and moderate stunting were also more prevalent among females 27(59%) than males 19(41%).

Table [4] Nutritional status of studied children according to age and sex

Nutritional status		Sex Male	female
Height	Normal 18(28.1%)	15(83%)	3(17%)
	Mild stunting 33(51.5%)	14(42%)	19(58%)
	Moderate stunting 13(20.4%)	5(38%)	8(62%)
BMI	Normal 37(57.8%)	22(58.5%)	14(41.5%)
	Mild Thinness 16(25.1%)	7(42.3%)	9(57.7%)
	Moderate thinness 11(17.1%)	5(45.5%)	6(55.5%)
	Total 64(100%)	34	30

7. DISCUSSION

Nocturnal enuresis is a common clinical problem in children. Although it is considered as a benign symptom, it causes substantial distress and presents significant psychosocial problems for children and their parents [8].

Many studies have been conducted in different countries to identify the prevalence of NE which has been reported differently in these studies; The difference in study design begin from definition of study population, population based or health facility based, as well as possible socio- demographic ,economic, cultural, racial and genetic difference in population studied.

The current study showed that the frequency of NE among 1st grade primary school children in Basra was (9.48%) which is similar to the finding of other studies in the field carried out in Pakistan at 2005 by Mithani et al who showed that the prevalence rate of NE was (9.1%) [9].

Similar rate reported in Iran by Beheshti (8.8%) ,Asfahan (7%)[9] and by AL-Rashed et al in Jordan (8.8%)[11].

Two studies from Turkey show a prevalence rate of nocturnal enuresis of (11.5%) and (13.7%) at 6-12 and 7-11 years (12, 13).

It is difficult to trace studies on enuresis in Iraq, Higher prevalence rate reported recently by Abed et al in Nassiryiah city among children aged 5-15years of (24.7%) [13] And by Wail A. on 2005 in Baghdad; in primary school children aged 6-7years of (32%) [15].

High result also reported by abdul wadood et al in Qatari students aged 6-12years (25%) [15], however the prevalence rate of enuresis varies with geographical areas, as well as the study population and the criteria used in the studies.Because enuresis is common among younger school children and its frequency decreases in conjunction with increasing age so the difference in age groups of studied children may explain the difference in prevalence rate; since this study enrolled young age group (6-7y) as compare to other studies.

Primary nocturnal enuresis was more marked than secondary enuresis, this agreed with other studies carried out in Thi-qar by abed et al, Iran, Jordan and Qatar [14, 1, 11, 16]

Majority of those with primary enuresis were daily bed wetter with frequency of (3—5) times/ week; this is consistent with other studies conducted in Isfahan by Azhir et al. [17]

Nocturnal enuresis is commonly a familial disorder which often has strong genetic roots with higher frequency in parents and sibling of bed wetter than in general population. The incidence in monozygotic twin is twice than in dizygotic twin [18].The current study concludes that family history was significantly associated with NE ; similar result was reported in Thi qar /Iraq , Iran ,Turkey and U.A.E, [14, 1 , 17 , 19].

It had been found that children with nocturnal enuresis had lower BMI, weight and height for age compared to their controls

A study performed in Finland in 1991 demonstrated that children with nocturnal enuresis suffered from slow growth in comparison with the control group [20]; another research conducted in England 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 [21]. Same result was concluded by Ayumi in 2001 in Japan [22].

A research conducted in Turkey by Sarici et al at 2003 also showed significantly higher incidence of fine and gross motor abnormalities, slower linear growth and short stature, retarded bone age, and reduced bone mineral density in enuretic children [23].

Growth retardation may be due to insufficient ADH secretion and growth hormone deficiency. As well as stresses which increase child susceptibility to enuresis can affect cortisol level and then affecting height [20].

This study demonstrates that growth failure is a coexisting problem in children with primary nocturnal enuresis, the weight, height and BMI of enuretic children were lower than their controls with higher frequency of mild and moderate thinness and stunting in enuretic girls.

Nocturnal enuresis can serve as easily noticeable indicator for delays in some spheres of child growth.

So promotion of school health program and psychological health program and monitoring any change in nutritional status of enuretic children over time and in relation to interventional programs, school feeding program may be good alternative.

Since enuresis and other stressful conditions in family can cause growth failure in children, the treatment of enuresis and eliminating stressful condition could be an effective measure in improving children's physical growth[1].

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