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Nocturnal enuresis in children and its associated factors: an experience from the Child Welfare Teaching Hospital in Baghdad

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ABSTRACT

INTRODUCTION: Enuresis is defined as a repeated, spontaneous voiding of urine in a child five years or older. There is two types of enuresis nocturnal and diurnal; Nocturnal enuresis is the commonest type. Although enuresis is considered a benign symptom, it causes a substantial distress and represents a significant psychosocial problem for children and their parents.

OBJECTIVE: The study was conducted to find the percentage of nocturnal enuresis in children attending Child Welfare Hospital and to assess association of demographic factors or medical problems on its development..

METHODS: A descriptive cross sectional study was carried out on total of 1097 children aging from 6-16 years, who are attending Child Welfare Teaching Hospital in Baghdad, Iraq from 1st February to 31st of May 2015. A questionnaire based survey was done in which some demographic factors and health problems of the child were taken from his parents.

RESULTS: Out of 1097 children studied, the overall prevalence of nocturnal enuresis was 300 (27.6 %). Factors that affect nocturnal enuresis are; age between 6-10 years, second order of child , positive family history of nocturnal enuresis, limited maternal literacy. Primary nocturnal enuresis was the most prevalent type 287 (95.6%) while secondary type is reported only in 13 (4.4%) children. Pure nocturnal enuresis was reported in 210 (70%) children. Awaking the child up at night for voiding (116, 45 %) and limiting drinking of water before sleep (94, 36.4 %) are the commonest measures used by the families to overcome this problem. And only 123 (41%)of parent have sought medical treatment, and the most commonly used drug was Imipramine 87 (29%). About 283 (94%) of families consider enuresis as a problem, and low self-esteem and embarrassment were the most frequent problem. Punishment used by parents in 88 (29.3%).

CONCLUSION: Enuresis is a common problem among children and it runs in families; however, families do not have adequate attention towards the problem and its treatment. Low level of educational of the mother and birth order of the child were factors of significant association with enuresis.

Key words: Children, Enuresis, Nocturnal enuresis

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INTRODUCTION

Enuresis can be defined as an intermittent incontinence in a child being at least five years old.[1] For the diagnosis of enuresis to be established, a child five to six years old should have two or more bed-wetting episodes per month, and a child older than six years of age should have one or more bed-wetting episode per month.[2] The prevalence has been found to be up to 20% in five-year-old children;[3] this percentage decreases as children become older 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.[4]

The objective of this study is to measure how frequent nocturnal enuresis is encountered among children attending the child Welfare Teaching Hospital in Baghdad and to study the effect of demographic factors and some medical problems on its development.

METHODS

Settings and study design: This is a descriptive cross sectional study (survey) conducted at Paediatric Consultation Clinic in Child Welfare Teaching Hospital in Baghdad, Iraq from 1st February 2015 to 31st of May 2015.

Ethical issues: We took the approval of the administration of the Child Welfare Hospital for conducting this study. We explained the aim of this study to parents and their verbal consent was requested before enrolment. Privacy, confidentiality, and anonymity of the patients and their parents were respected through all stages of the study.

Definition, inclusion and exclusion criteria: In this study, we used convenient sampling to select the participants. All clients of paediatric consultation clinic who were 6-16 years old were eligible to be included in this study. For the sake of our study, we defined enuresis as urinary incontinence beyond age of 5 years for at least a 3-month duration.[5] We included all types of enuresis; primary, secondary, monosymptomatic, non-monosymptomatic and diurnal. Patients with cerebral palsy, any type of mentally handicapped (e.g. Down syndrome) and those unwilling to participate were excluded.

In our study, we defined the following terms as: Primary nocturnal enuresis is bed-wetting in a child who has never been consistently dry at night for a period of 6 months.[6] Secondary nocturnal enuresis is bed-wetting in a child who has previously a period of at least 6 months of dryness.[6] Daytime wetting is urinary incontinence that occurs while the child is awake.[6] Monosymptomatic Nocturnal enuresis (NE) is enuretic children with perfectly normal voiding pattern during waking hours.[7] Nonmonosymptomatic enuresis is enuresis with lower urinary tract symptoms (e.g., Increase or decrease in voiding frequency, daytime wetting, urgency, hesitancy, straining, weak or intermittent stream, post-urination dribbling, holding manoeuvres, sensation of incomplete emptying, lower abdominal or genital discomfort).[8]

Formulation of questionnaire: the questionnaire form was prepared by the researchers themselves based on reviewing the similar studies and revised by scientific researchers of paediatric nephrologist and Uro-Surgical specialists. The questionnaire included the following information: Demographic feature, enuresis history, family history, previous use of therapies and family attitude regarding this problem.

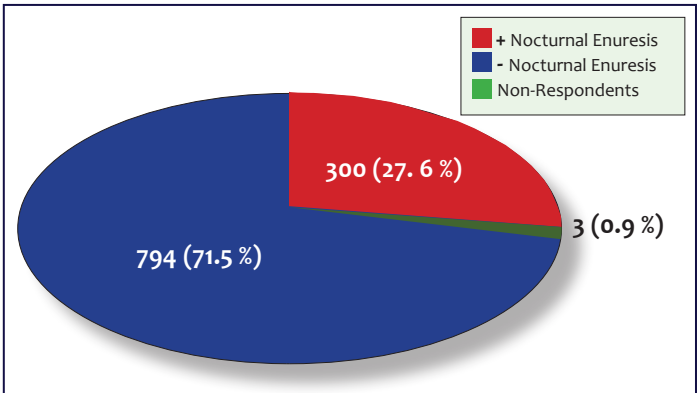

Figure 1: Prevalence of Enuresis

Collection of data: The study conducted on 1097 child from age of 6-16 years old. The study carried out by direct interview with parents for about 10 minutes. During the interview, researchers have explained the questions to the parents and get their answers. The questionnaire forms have been filled in by researchers themselves based on the data taken from the families.

Statistical analysis: Statistical Package for Social Sciences version 20 (SPSS v20) was used for data input and analysis. Discrete variables presented as numbers and percentages and continuous variables presented as means with their standard deviations. Chi-square test for goodness of fit was used to test the significance of observed distributions. Findings with P value equal to or less than 0.05 were considered statistically significant.

RESULTS

During the studied period, 1097 children whose age were between 6-16 years and visited the consultancy clinic at Children Welfare Hospital were targeted in our study. Three hundred and three (27.6 %) reported to have nocturnal enuresis (NE); however, our calculation was made on three hundred children because three of them were rejected to participate giving a non-response rate of 0.9 %. Figure 1.

Table 1 shows the effect of gender, age and order of the child among his siblings on having nocturnal enuresis. Though boys are more reported to have NE than girls but this difference has gained no statistical significance. Seventy-two percent of children with NE were between age of 6-10 years then decreased remarkably

Table 1: Distribution of studied sample according to demographic characters

	Variable	Number	%	P value
Gender	Male	161	53.7	0.204
	Female	139	46.3	
Age (Years)	6-10	216	72.0	<0.001
	10-16	84	28.0	
	Mean=9.0, Median=9.0, SD=2.5			
Order among siblings	First	88	29.3	
	Second	100	33.3	
	Third	56	18.7	<0.001
	Forth	23	7.7	
	> Forth	33	11.0	
Education of the mother	Less than primary	40	13.3	<0.001
	Primary	168	56.0	
	Secondary	67	22.3	
	Diploma or Bachelor	9	3.0	
	Postgraduate	16	5.3	
Family history	Positive for Nocturnal enuresis	205	68.3	<0.001
	Negative for Nocturnal enuresis	95	31.7	
Relatives who have nocturnal enuresis	Sister	59	28.8	
	Brother	51	24.9	
	Cousin	35	17.1	
	Mother	18	8.8	< 0.001
	Father	15	7.3	
	Paternal uncle	14	6.8	
	Maternal uncle	7	3.4	
	Paternal aunt	4	2.0	
	Maternal aunt	2	1.0	
Total		205	100	

thereafter. Children how rank second and first are more common to have NE 100 (33.3 %) and 88 (29.3 %) respectively and this was statistically significant.

Most of mothers were at primary school level 168 (56.0%) and this result has significant effect on proportion of NE (P value <0.001). About two thirds of children with enuresis have a positive family history of NE. In 59 (28.8 %) children the sister is involved and in 51 (24.9 %) the brother involved and these differences is statistically significant (p < 0.001). table 1

Most of children 278 (92.7%) have reached daytime urinary control at a mean age of 2.5 year. Severe nocturnal enuresis i.e. wetting beds daily was reported in 145 children 48.3% with statistically significant (p<0.001) table 2.

Table 2: Distribution of studied sample according to urinary control

	Variable	No.	%	P value
Age at using toilet for urination during daytime	≤ 3 years	278	92.7	< 0.001
	> 3 years	22	7.3	
	Mean=2.5, Median=2.0, SD=0.9			
Days/week stay dry	0	145	48.3	< 0.001
	1-3	73	24.3	
	4-7	82	27.3	
	Mean=1.8, Median=1.0, SD=2.1			
Aware of wetting bed	Yes	25	8.3	< 0.001
	No	275	91.7	

Table 3: Distribution of studied sample according to type of enuresis

Variable	Number	%	P value
Primary	287	95.6	<0.001
Secondary	13	4.4	
Nocturnal	210	70	<0.001
Nocturnal-Diurnal	90	30	
Total	300	100	

Table 4: Distribution of studied sample according to events occurred during child life

Variable	No.	%	P value
Child ingests caffeine containing drinks			
Yes	143	47.7	0.419
No	157	52.3	
Total	300	100	
Witnessed upsetting event			
Yes	50	16.7	< 0.001
No	250	83.3	
Total	300	100	
This event is...			< 0.001
New sibling	5	10.0	
School	6	12.0	
Divorce	5	10.0	
Death	4	8.0	
Night mare	30	60.0	
Total	50	100	
Encountered a Health problem			0.564
Yes	145	48.3	
No	155	51.7	
Total	300	100	
This health problem is/are*			< 0.001
Urinary tract infection	52	35.9	
Learning problem	18	12.4	
Sleep problem	33	22.8	
Kidney/bladder congenital anomalies	10	6.9	
Atopy	6	4.1	
Diabetes	5	3.4	
ADD/ADHD	3	2.1	
Epilepsy	2	1.4	
Others	16	11.0	
Total	145	100	

*More than one health problem could occur together

In this study, 275 (91.7%) children are not aware at any time during sleep that they will wet their beds (P <0.001). table 2

In this study the major type of nocturnal enuresis is primary 287 (95.6%) while secondary type represents only 13 (4.4%). The study also shows that in 90 (30%) of children with NE, diurnal enuresis was concomitantly present. Table 3

Table 4 shows effect of having caffeinated drinks, stress events, and underlying health problem on development of enuresis.

Regarding measures used by parents to control the problem of enuresis, 86.3% of parents used general methods and the most preferable

Table 5: Interventions used by the family to control bladder habits:

Variable	Number	%	P value
Measures made to keep the child dry			< 0.001
Yes	258	86.3	
No	42	13.7	
What type of measure is used			
Parent wake	116	45.0	< 0.001
Less drinking*	94	36.4	
Diaper	42	16.3	
Alarm clock	4	1.6	
Punishment	2	0.8	
Dry calendar	0	0.0	
Rewards	0	0.0	
Total	258	100	
Given medical treatment			
Yes	123	41.0	0.002
No	177	59.0	
Total	300	100	

*Less drinking = 2 hours before sleep

one was awaking the child at night (45%) followed by limit fluid intake before sleep (36.4%). Forty-one percent of parents seek for medical treatment to control enuresis. Table 5

The most common drug used for treatment of enuresis in this study is tricyclic anti-depressant (Imipramine) reported in 87 cases (29.0%). Desmopressin is the second, reported in 49 children (16.3 %). Patient may be given more than one drug during the course of treatment of noc-

Table 6: Distribution of the studied sample according to drugs used for treatment of nocturnal enuresis

Variable	Number	%	P value
Imipramine			
Yes	87	29.0	<0.001
No	213	71.0	
Total	300	100	
Desmopressin			
Yes	49	16.3	<0.001
No	251	83.7	
Total	300	100	
Herbal			
Yes	3	1.0	<0.001
No	297	99.0	
Total	300	100	
Others			
Yes	2	0.7	<0.001
No	298	99.3	
Total	300	100	

Table 7: Distribution of the studied sample according to problems related to NE

Variable	Number	%	P value
NE is a problem for child/family			
Yes	283	94.3	< 0.001
No	17	5.7	
Total	300	100	
Problem with NE is			< 0.001
Embarrassing/low self esteem	153	54	
Have to wash more linens/clothes	120	42.4	
Getting teased	8	2.8	
Cannot sleep over	0	0.0	
Others	2	0.7	
Total	283	100	
Punished for bed wetting			< 0.001
Yes	88	29.3	
No	212	70.7	
Total	300	100	

turnal enuresis. Table 6

Enuresis has a psychological and social impact on the child and his family. In our study, 283 (94.3%) families of children with nocturnal enuresis considered this disease a problem for their children and for them. Embarrassment and low self-esteem (153, 54%) was the major impact on the child, while washing more linens and clothes (120,42.4 %) was the major problem for families especially the mothers. Punishment is still practiced among families, and it has reported by 88 (29.3%) families of children with nocturnal enuresis. Table 6

DISCUSSION

Enuresis is a worldwide problem; however, its prevalence in the communities has some controversy. Several studies have been conducted worldwide, and large differences in prevalence have been noticed even among countries of the same geographic region.[3] The difference in prevalence of NE in these studies may be due to variation in socio-demographic, economic, cultural, racial and genetic factors in populations studied. In our study, the percentage of nocturnal enuresis was 27.6%; this percentage represents all types of nocturnal enuresis (alone or with diurnal). The prevalence of enuresis reported by other studies from Iraq were comparable to ours; it was 27.7 % in Al-Nassiriya city[9] and 29.5 % in Al-Imamain Al-Kadhimain City in Baghdad.[10]

In Iran the prevalence of primary and day time incontinence was 18.7% and 5.5% respectively.[1] A study from Qatar, conducted in 2008, has reported that the prevalence of enuresis was 25%.[11] In Lebanon in a study done by Merhi et al, the prevalence of MNE (monosymptomatic nocturnal enuresis), diurnal enuresis and mixed (nocturnal –diurnal enuresis) was found to be 5.3%,1.25%,1.5% respectively.[3] In Turkey a study conducted by Gur et al has reported that the prevalence of enuresis is 12.4%.[12] In Korea the prevalence of nocturnal, diurnal and combined enuresis was 9.2%, 2.2% and 1.4%, respectively.[13] The huge variation in the prevalence of enuresis in difference studied from difference countries can be attributed to the variation of range of age included (a study may include preschool age only, while others include only teenagers), definition of enuresis, genetic predisposition, and traditional and cultural background.

In our study, boys outweigh girls in having NE (Table 1) but this difference has got no statistical significance p = 0.204. This finding is similar to that of Abed et al,[9] but contradict that of Aljefri[14] from Mukalla City in Yemen and Hansakunachi[15] from Thailand who reported girls predominance.

The prevalence of nocturnal enuresis is increasing with age from 6 to 10 years and remarkably decreased thereafter and this is consistent with a result from Basra- Iraq (unpublished research)[16] and from Lebanon.[3]

In this study, more nocturnal enuresis was recorded in children who were of 2nd birth order (33.3%) (p <0.001). Birth of younger siblings may be regarded as a factor causing bedwetting among the older siblings. This may be due to reversion to infantile habits as a result of unhappiness, feeling of insecurity, or jealousy. This finding was supported by other Iraqi studies,[16,9] while an Egyptian study has showed that birth rank does not affect the prevalence of enuresis.[17]

Level of education of mothers of children with NE is another controversial issues among studies. We found that more than two thirds of women were illiterate or having primary school education and this obvious difference was statistically significant. A study from Mosul- Iraq[18] and from Iran[1] have support this results, while Saleh[10] from Iraq and Hansakunachai[15] from Thailand found no significant association between level of education of the parents and

enuresis in their children.

Enuresis is a common familial disorder, which often has strong genetic background with higher frequency in parents and siblings.[10] In present study, a positive family history of NE was reported in (68.3%) of studied sample. Chang et al,[19] Kanaheswari,[20] Eapen[21] and Mahmoodzadeh[1] have come up with similar results.

Primary NE is the most common type of enuresis with at least one episode of bed-wetting per a month.[4,22] In this study primary NE was more prevalent than secondary nocturnal enuresis, 95.66% and 4.4% respectively. This result agrees with Abed,[9] Yousef,[14] and Aljenaei.[11] In our study, diurnal enuresis was associated with nocturnal enuresis in 30% of cases and this is consistent with Yemeni study,[14] but it is considered high in comparison to other studies from Al-Nassiriyah,[9] and Al-Basra cities[16] in Iraq; and a study from Iran,[1] which they have reported 3% , 12.5% and 5.5 % respectively. Diurnal enuresis is a significant symptom of urinary tract infection (UTI) in children which was reported in our study in about a third of children. So the relatively high percentage of association of diurnal enuresis may be attributed to the presence of UTI.

Over 90 % of the children in our sample were unaware that they wet their beds during sleep, this can be attributed to high arousal threshold[23] or disturbance of arousal system that turn deep sleep to light sleep when bladder was distended.[24] The role and nature of psychological factors associated with enuresis is controversial with some arguing that psychological disturbances in the child and psychosocial stressor in the family may be the result rather than the cause of bed-wetting.[17] In this study, the most frequent upsetting event linked to enuresis by the parents was night mare reported in 60%, this agrees with that of Hui-lung Tai et al.[25] We reported that about half of children with enuresis have encountered one or more health problem. The most and the significant one is a history of UTI which was reported in about a third of children. Many studies[1,10,21] agree with this result.

In present study, most of families are significantly concerned about the problem of bed-wetting and the most preferred behavioural technique used by them to manage their child with bed-wetting is awaking the child up at night to void and next to it is restriction of fluid intake in the evening (Table 5), this finding agrees with Thailandian and Korean studies.[15,12] General knowledge of the parents about the causes and effective treatments for enuresis is lacking. Only 41% reported that they asked for medical care for their child with enuresis. In our study tricyclic anti-depressant (TCA) is used more than other drugs (29%), followed by desmopressin and herbal substance (6%.3, 1%) respectively. In this study about one third (29.3%) of parents react to their children's problem of enuresis by punishment, this result resemble Qatari study by Aljenaei et al.[11] In Honk Kong study, CFN NG et al has reported that 57% of parents punish their children for wetting beds at night,[26] and in Turkey, Karaman et al [27] has reported that punishment is used by 58.1 % of the families as response towards their children with NE. This punitive approach and poor family relationship makes it unlikely to provide a supportive emotional climate for the young person to learn the skill of becoming dry, and in turn leads to further frustration and helplessness.[26]

CONCLUSIONS

Nocturnal enuresis is a common health problem in children, more in boys and it runs in families. Primary monosymptomatic nocturnal enuresis is the most frequent type. Nocturnal enuresis has a significant psychosocial impact on the children and the families; however, families have little attention towards this problem and its management.

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Abbreviation list:

Monosymptomatic Nocturnal Enuresis (**MNE**), Nocturnal Enuresis (**NE**), Statistical Package for the Social Sciences (**SPSS**)

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