

Nocturnal Enuresis at a Primary Health Care Setting: Analysis of 117 Cases

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Objective: To evaluate the social and personal characteristics, symptomatology, associated factors and management of nocturnal enuresis.

Design: Retrospective case-series study.

Setting: Primary health care center, Al Khobar, Saudi Arabia.

Method: One hundred and seventeen medical records of confirmed nocturnal enuresis from 1st January 2009 to 30 December 2009 were reviewed. Diagnosis of nocturnal enuresis was based on detailed history and physical examination.

Result: Males were 76 (65%), 96 (82.1%) were of school age. Sixty-eight (58%) patients had positive family history of enuresis in one of the parents while 69 (59%) showed positive family history in one of the siblings. Seventy-two (62%) children were punished for bedwetting. Patients who improved with instructions and medications were 77 (66%). Ninety-five (81%) patients were enuretic for most of the nights. A significantly higher proportion of patients aged 7-18 years improved by instructions plus medication.

Conclusion: Parents of enuretic children seek medical care when the child is too old. Health education of parents is needed to explain the condition and treatment options and advice against punishment.

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Nocturnal enuresis is a common problem, affecting an estimated 5 to 7 million children in the United States and occurring three times more often in boys than in girls¹. Unfortunately, only about one-third of the families of children with this frequently troubling problem seek help from a physician^{1,2}. Enuresis has been under-reported and some parents do not see it as a source of concern³.

Nocturnal enuresis is defined as repeated, spontaneous voiding of urine during sleep in a child five years or older⁴. Children with nocturnal enuresis can be either primary (less than 6 months dry) or secondary (relapse after 6 months dry) and can occur in both the monosymptomatic (uncomplicated) and non-monosymptomatic (with lower urinary tract symptoms) forms^{2,4,5}.

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Nocturnal enuresis is three times more common than daytime wetting and affects 6.7% of younger children and 2.8% of older children^{6,7}. Secondary causes account for less than 25%^{8,9}.

Nocturnal enuresis is a source of shame and embarrassment for many children. It profoundly affects the child's life socially, emotionally and behaviourally and impacts the family life¹⁰.

Most children with primary nocturnal enuresis require only an enuresis-focused history, physical examination, and urinalysis before initiation of treatment; imaging and urodynamic studies are rarely needed^{4,5,8,11,12}.

Treatment of primary nocturnal enuresis should begin with educating the child and parents about the condition. The family should be reassured that primary nocturnal enuresis usually resolves spontaneously; while secondary should be treated^{5,9}. Simple behavioral interventions are first-line treatment. Arousal alarm systems and pharmacotherapy should be considered in both primary and secondary enuresis and in older children who have greater social pressures and low self-esteem. Medication should be initiated in children seven years and older^{5,9,12}. Children who do not respond to one or more measures may benefit from combined treatment strategies, combining non-pharmacologic and pharmacologic treatment or multiple pharmacologic therapies^{5,9,12}. However, treatment approaches for different age groups are not yet settled.

The aim of this study is to evaluate the social and personal characteristics, symptomatology, associated factors and management of nocturnal enuresis.

METHOD

One hundred and seventeen medical records of confirmed nocturnal enuresis registered at the PHC center from 1st January 2009 to 30 December 2009 were reviewed. The diagnosis of nocturnal enuresis was based on detailed history and physical examination¹². Behavioral and neurological examinations were done for suspected cases of enuresis. Body mass index (BMI) for age percentile was estimated for each case according to the CDC definition¹³. Laboratory tests, such as urine examination and culture or other relevant tests, such as abdominal ultrasound, blood glucose level and urodynamic studies were done to exclude other causes of enuresis.

Types of treatments used for enuretic children in the PHC center included: instructions (reassurance of parents that it is self-limited, avoid punishment of the child, fluid restriction in the evening, use of alarm and motivational therapy such as star chart) and medications (mainly desmopressin). Primary nocturnal enuresis was diagnosed if the patient was not dry for at least 6 months⁴.

Data Collected from the Medical Records Included:

- a) Social and personal characteristics such as: age, gender, educational level and nationality.
- b) History, physical examination and management of cases of NE: presence of medical problems at birth, positive history of nocturnal enuresis in one of the parents or siblings, positive history of surgery in the back or urinary system, calculation of BMI for age percentiles, history of physical punishment, the type of previous management and the outcome.
- c) Urinary symptoms and signs experienced by patients with nocturnal enuresis: difficulty reaching the bathroom, frequency of urination at night, frequency of urination during the day, amount of urination, urine analysis.

The study was approved by the Directorate of the PHC centers. Variables collected were coded and entered into the SPSS-PC statistical package version 16 for windows in a personal computer.

RESULT

One hundred and seventeen were diagnosed as ‘nocturnal enuresis’. One hundred and six (90.6%) were primary and 11 (9.4%) were secondary. Table 1 shows the social and personal characteristics of patients with nocturnal enuresis. Seventy-four (63%) children aged $7 \leq 13$ years. Males were 76 (65%). One hundred and seven (92%) were Saudis. Ninety-six (82.1%) patients were of school age.

Two (1.7%) children had some medical problems at birth. Sixty-eight (58%) patients had a positive family history of enuresis in one of the parents while 69 (59%) revealed positive family history in one of the siblings, see table 2. None of the children suffered from behavioral or neurological symptoms and none had surgery in the back. No abnormality was detected in patient on physical examination. The body mass index (BMI) for age percentile was normal in 85 (73%) patients, while 17 (14.5%) were overweight and 14 (12%) were obese.

Table 1: Socio-demographic Characteristics of Patients with Nocturnal Enuresis

Characteristics	(n=117)	
	Number	Percentage
Age in years		
5 ≤ 7	28	23.9
7 ≤ 13	74	63.2
13-18	15	12.8
Mean Age (± 1 S.D) = 8.79 ± 3.04		
Gender		
Male	76	65.0
Female	41	35.0
Nationality		
Saudi	107	91.5
Non-Saudi	10	8.5
Educational Level of patients		
Preschool	21	17.9
School	96	82.1

Seventy-two (62%) children were physically punished for bedwetting. Seventeen (14.5%) patients received treatment before seeking medical advice at the PHC center. Sixteen (13.7%) improved with instructions from their doctor, see table 3. Seventy-seven (66%) improved with instructions and medications.

Table 3 shows that 65 (55.6%) patients had difficulty reaching the bathroom. Forty-six (39%) patients urinated seven or more times during the day. Ninety-five (81%) were positive for frequent urination most nights. The amount of urine was large in ninety-nine (85%) patients, as reported by parents of the enuretic children. Urine Analysis was positive for urinary tract infection, pus cells were found to be more than 10 cells/ HPF in 5 (4.3%).

There were no statistically significant associations between parents' punishment for bed wetting and either age, gender, educational level, nationality and presence of urinary symptoms such as the amount of urination at day or night and frequency of urination at night.

Table 2: History, Physical Examination and Management of Cases of Nocturnal Enuresis

Variable	(n=117)	
	Number	%
Asphyxia at birth	2	1.7
Positive history of nocturnal enuresis in one of the parents	68	58.1
Positive history of nocturnal enuresis in one of the siblings	69	59.0
Positive history of surgery in back or urinary system	0	0.0
Abnormal physical examination	0	0.0
Presence of behavioral and neurological symptoms	0	0.0
BMI for age percentiles		
Underweight	1	0.9
Normal	85	72.6
Overweight	17	14.5
Obese	14	12.0
Patients used to receive physical punishment	72	61.5
Patients who received treatment before coming to the center	17	14.5
Type of management and outcome		
Instructions only - patient improved	16	13.7
Instructions only - patient did not improve	24	20.5
Instructions & medication - patient improved	77	65.8
Instructions & medication - patient did not improve	0	0.0

Table 3: Urinary Symptoms and Signs Experienced by Patients with Nocturnal Enuresis

Variable	(n=117)	
	Number	%
Difficulty reaching bathroom		
Yes	52	44.4
No	65	55.6
Frequency of urination at night		
Most of the nights	95	81.2
1-2 times/week	22	18.8
Frequency of urination during day		
7 or more times	46	39.3
Less than 7 times	71	60.7
Amount of urination		
Small amount	18	15.4
Large amount	99	84.6
Urine analysis		
Normal	112	95.7
Abnormal	5	4.3

A significantly proportion of patients who were managed by instructions and medication improved compared with those who received instructions only, see table 4 ($X^2_{(df2)}=6.15$; $p=0.046$).

Table 4: Association between Type of Management and Age Group of Patients with Nocturnal Enuresis

Type of management	Age group of patients				Total (n=117)		χ^2 -test (P Value)
	5≤7 years (preschool, n=28)		7-18 years (school, n=89)				
	No.	%	No.	%	No.	%	
Instructions only - patient improved	6	21.5	10	11.2	16	13.7	6.15 (0.046)
Instructions only - patient did not improve	9	32.1	15	16.9	24	20.5	
Instructions & medication - patient improved	13	46.4	64	71.9	77	65.8	

DISCUSSION

The majority of enuretic patients were 5-12 years. This result was similar to Mbibu et al who showed that the age range of children with enuresis was 5-14 years with a median of 8 years¹⁴. Iduoriykemwen et al showed that the mean age of enuretic children was 8.3 ± 2.8 years¹⁵.

In this study, children 13 years and above represented only 12.8%. Several studies had shown that the prevalence of enuresis decreased with increasing age¹⁵⁻¹⁸. A study revealed that at the age of 7 years, 9% of children had enuresis and this prevalence decreased by age 9 to 7.6% and by age 12 to 2.1% respectively¹⁷.

In this study, the frequency of nocturnal enuresis was higher among males 76 (65%) than females, this similar to the result of other studies^{16,19-22}.

The majority of patients with enuresis were Saudis, 107 (91.5%), which reflected the eligibility criteria for seeking health care at Saudi PHC centers. Ninety-six (82%) patients were school children. This finding reflected the delayed diagnosis of this condition and that parents of children seek medical care too late. The majority of the studies on nocturnal enuresis were conducted among primary school children¹⁴⁻²¹.

Less than 2% of patients with enuresis had birth asphyxia. However, in this study no abnormal behavioral and neurological symptoms or abnormal physical findings were reported. Several studies have shown that enuretic children had more medical and congenital problems at birth compared with non-enuretic children^{14,20,21,23,24}. Bourquia et al showed that enuresis was associated with diabetes and asthma in 23% of the children and with a urological disorder in 13% of the cases²³.

Singh et al revealed that urinary infections, spina bifida and encopresis in 10%, 4% and 3% of enuretic children²⁴. They reported an association of behavioral symptoms with enuresis: teeth grinding (60%), over activity (40%), fear and worries (40%). Thakur et al reported several stress factors and behavioral characteristics: fear of darkness, teeth grinding and hyperactivity²⁵. In another study, attention deficit hyperactivity disorder (ADHD) was found to be strongly

associated with enuresis²⁶. The physicians or parents might have missed the presence of abnormal behavioral and neurological symptoms in enuretic children in our study.

In this study, more than half of the patients with enuresis had a family history of nocturnal enuresis; this is similar to other studies^{15,16,18,23,24,27-29}.

This study showed a high prevalence of overweight and obesity among enuretic children, 17 (14.5%) and 14 (12.0%) respectively. This finding might reflect problems of food intake as part of the behavioral and emotional manifestations of enuretic children; this finding was consistent with other studies^{24,25}.

In this study, 72 (61.5%) patients used to receive physical punishment by their parents. This result was higher than the fourteen percent reported by Hazza et al and higher than Bourquia et al study who reported 15%^{16,23}. This finding reflected the lack of education and awareness of the parents about their child's problem. This was also evident in the low percentage of enuretic patients who received treatment before coming to the PHC, 17 (14.5%). Jian et al reported only 6% of the 411 primary nocturnal enuresis children had sought professional help¹⁸.

In this study, patient with enuresis received different modalities of treatment. Table 2 showed that the use of medications beside instruction (motivational, behavioral and bladder training) gave a better outcome 77 (65.8%), than the use of instruction alone 16 (13.7%). Several trials with desmopressin had shown a significant improvement in enuresis³⁰⁻³³. Our result was similar to many other studies^{21,29}. De Sousa et al study showed 60% improvement with drug and counseling²¹.

Difficulty in reaching the bathroom was reported by parents as a major factor in bedwetting by their children, 52 (44.4%), the child did not stop bedwetting even if he was aroused. This result is verified by the large amount of urine voided by a large proportion of patients in this study, 99 (84.6%), as reported by their parents. These findings might be related to deep sleep and poor arousal (difficulty in making the child get up and pass urine)^{21,28-29}. The severity of enuresis in this study was manifested by the high frequency of urination during most night as well as during the day, this was similar to several studies^{18,21,27-29}. De Sousa et al showed that the majority of children (36.61%) were bedwetting every night²¹.

Kalo et al revealed that 30% of enuretic wet their beds during daytime²⁷. In this, study only few enuretic patients showed abnormality of urine analysis, 5 (4.3%); other studies showed a minor role of urinary tract infection^{15,20,24}.

In this study, a significantly proportion of older children, 7-18 years, improved with medications and instructions, 64 (71.9%), compared with preschool children 5 to less than 7 years, 13 (46.4%). This is consistent with the recommendations that drug therapy for enuresis is not usually appropriate for children under 7 years of age^{22,33}. In this study, a higher proportion of enuretic children received medications, 77 (65.8%). Combined treatment, drugs and behavioral therapy had been shown to give a better and long-term improvement^{22,33}.

CONCLUSION

Nocturnal enuresis is a common problem among children in Saudi Arabia. Parents with enuretic children usually seek medical care when the child is too old. This might have

adverse effects on the child and the family. Primary health care physicians should screen routinely for enuresis and encourage parents to bring their child for treatment. Health education of the parents by the PHC team is needed to advise against punishment of the enuretic child and explain the various modalities of treatment.

Although this study revealed some of the important features of nocturnal enuresis, it did not identify the risk factors associated with the disease. This is common in case series studies as there was no control group. Data were collected from the medical records which were standardized and well-recorded by the physicians. However, some parents of enuretic children might not respond correctly to some sensitive questions such as punishment of the child.

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