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Original Research Article

Clinical profile and risk factors of enuresis in children

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ABSTRACT

Background: Enuresis is a common problem in children and its incidence is multifactorial in nature. The aim of this study is to assess the etiological risk-factors in enuresis in the study population and also to compare the risk factors in enuresis subgroups.
Methods: A total of 51 patients with enuresis presenting to the department of paediatrics, Institute of Social Paediatrics, Govt. Stanley Hospital, Chennai were included in the study. All children were sub classified as primary/secondary and the primary enuretics were sub classified into monosymptomatic/non monosymptomatic depending on the symptoms. The data was analyzed and the results presented.
Results: Enuresis was common in boys. Statistically significant difference in the incidence of disorder between primary and secondary enuretic children was seen in relation to presence of storage symptoms (p=0.04), cystitis (p=0.013) sleep disordered breathing (p=0.0001) and low-income status (p=0.04). No statistically significant difference between into monosymptomatic nocturnal enuresis (MNE) and non-monosymptomatic nocturnal enuresis (NMNE) children was observed in terms of gender, difficulty in arousal, specific gravity, spina bifida, low bladder capacity and family history (p>0.05).
Conclusions: The findings of the study reported that risk factors related to the incidence is similar in both primary and secondary enuresis. MNE and NMNE have no differences in the presentation and probably represent the spectrum of a same disorder.

Keywords: Enuresis, Monosymptomatic nocturnal enuresis, Non-monosymptomatic nocturnal enuresis, Risk factors

INTRODUCTION

Enuresis is commonly known as bedwetting and is type of elimination disorder.[1] It is very common problem of childhood, affecting children age group ranging from 5-18 years old. Approximately 15-20% of 5 years old child wet their beds during night time and they achieve control each year so that after the age of 15 years only 1% of child will have the problem of enuresis.[2,3]

It should be considered as symptom rather than a disease. Its incidence is multifactorial including abnormal sleep patterns, urinary tract infections, developmental delay, spina bifida, family history and bladder related disorders.[4-6]

The condition of enuresis is classified into primary and secondary enuresis based on the bed wetting behaviour of the child. Primary enuresis refers to children who have been not trained successfully to control urination and secondary enuresis refers vice-versa and are continent for at least 6 months but revert to wetting due to stressful situations.[7-9]

Primary enuresis can be classified into monosymptomatic nocturnal enuresis (MNE) and non-monosymptomatic

nocturnal enuresis (NMNE) on the basis of the absence or presence of daytime voiding symptoms respectively.[10]

The study was designed to assess the etiological risk-factors in enuresis in the study population and also to compare the risk factors in enuresis subgroups.

METHODS

This descriptive observational study was conducted in the Institute of Social Paediatrics, Govt. Stanley Hospital, Chennai. The study was conducted between January 2008 till June 2009. All children between the ages of 5 to 12 who presented to the OPD with the complaint (as a primary one or one of the many) of bedwetting constituted the study material. Children with developmental delay/cerebral palsy or other manifest neurological disorder were excluded.

Detailed history of the patients was collected in a predesigned proforma and complete neurological examination was done. Ultrasound abdomen was also done in each case for any renal/bladder wall changes and residual urine after voiding.

All patients were given a frequency - volume chart and asked to fill it up over 48 hours at home and the charts were collected back. All children were sub classified as primary/secondary and the primary enuretics were sub classified into monosymptomatic/non monosymptomatic.

The data were entered and analyzed using Epiinfo software. Chi-square tests was used wherever necessary and Fisher p tests (where numbers were small and chi-square could not be applied) were used to compare the groups.

RESULTS

A total of 51 patients with enuresis presented during the study period. No parent or child refused to participate in the study. There were 30 males (58%) and 21 females (42%) and the difference in sex is not significant ($\chi 2=3.001$, p=0.223). Of the 51 children who were enuretic, 48 had only nocturnal enuresis (94%). No strict daytime enuresis was recorded. Combined daytime and nocturnal enuresis accounted for only 3 cases (6%). 84% of cases were primary (n=43) while only 16 % were secondary (n=8). (Table 1) presents the demographic characteristics of the study participants.

Table 1: Age and sex distribution of primary and secondary enuresis cases.

Age group (in years)	All case (n=51)	Primary (n=43)	Secondary (n= 8)
	N (%)	N (%)	N (%)
5-7	19 (37.3)	17 (39.5)	2 (25)
8-10	19 (37.3)	17 (39.5)	2 (25)
11-12	13 (25.4)	9 (21)	4 (50)
Sex			
Male N (%)	30	26 (60.5)	4 (7.84)
Female N (%)	21	17 (39.5)	4 (50)

Risk factors associated with enuresis are listed in (Table 2). The risk of enuresis is more common in boys (58.8%) compared to girls. The other risk factors include are storage symptoms related to urinary bladder (43.1%), bladder over activity (51%), cystitis (9.8%), difficulty in arousal (52.9%), spina bifida (37.25%), low bladder capacity (51%), family history (41.2%), and difficulty in arousal (52.9%). low specific gravity was noted as a risk factor since nocturnal polyuria due to defect in ADH secretion is a putative causal factor (54.9%).

Comparison of risk factors in primary enuretics with secondary enuretic was presented in (Table 3). When compared both primary and secondary enuretics were similar in presentation except in storage symptoms, cystitis symptoms and symptoms of sleep disordered breathing which were significantly higher in secondary enuresis and low income which was more significant in primary enuresis. Storage symptoms like increased day time frequency, daytime incontinence and nocturia were significantly more associated with secondary enuresis than primary (p=0.04). Symptoms of bladder over activity like urgency and urge incontinence were the commonest daytime symptoms in enuresis (51%, n=21), there was not any significant difference between primary and secondary enuresis (p=0.47).

Symptoms of cystitis like dysuria, lower abdominal pain, haematuria were present in 5 cases though documented UTI was present only in 2 cases and cystitis symptoms were more in secondary enuresis which was also statistically significant (p=0.0132). Difficult to arose was seen in 52.7% of study population and the difference between primary and secondary category is significant. Spina bifida was present in 37.25% of all children and there was no significant difference in the two groups (p=0.351). There was no significant difference in the two groups with regards to the bladder capacity. Constipation

was present in only 2 cases and there was no significant difference between the groups (p=0.266). There was no difference statistically in the presence of family history. Symptoms of sleep disordered breathing such as snoring, mouth breathing or increased sleepiness in the day were associated with secondary enuresis (p=0.0001). Low income groups were the predominant group (60.8%) and were more significantly related to primary enuresis (p=0.04).

The characteristics of monosymptomatic versus non monosymptomatic enuresis are tabulated in (Table 4). The incidence of NMNE is common in boys compared to girls but no significant association was seen between two groups. Children who face difficulty in arousal from sleep are more likely to have NMNE than MNE but the difference is not significant. No statistically significant difference between MNE and NMNE children was observed in terms of low specific gravity, spina bifida, low bladder capacity and family history.

Table 3: Comparison of risk factors in primary enuretics with secondary enuretics.

Variable	Primary	Secondary	χ^2	p
Storage symptoms				
Present	13	6	4.026	0.0448
Absent	30	2		
Bladder Overactivity				
Present	22	4	0.105	0.475
Absent	21	4		
Cystitis				
Present	2	3	4.93	0.013
Absent	41	5		
Arousability				
Difficult	22	5	0.042	0.419
Moderate and easy	21	3		
Specific gravity				
Low	24	4	0.007	0.38
Normal	19	4		
Spina bifida occulta				
Present	17	2	0.146	0.351
Absent	26	6		
Bladder capacity				
Low	21	5	3.053	0.217
Normal	22	2		
High	1	1		
Constipation				
Present	2	0	0.137	0.2669
Absent	41	8		
UTI				
Culture positive	2	1	0.002	0.4747
Culture Negative	41	7		
Family history				
Present	19	2	0.386	0.267
Absent	24	6		
Sleep disordered breathing				
Present	2	5	14.49	0.0001
Absent	41	3		
Socioeconomic class				
Low income	29	2	4.217	0.04
Not Low	12	6		

DISCUSSION

Nocturnal enuresis (NE) is very common micturition disorder in children. Many studies have shown varying prevalence of NE in children. These characteristics vary

in different age groups. At least one NE event per month has been reported in over 10% of children 6 years of age, 2-5% in 10-year-olds, and 0.5-3.0% of 12 years and above.[11]

Table 2: Risk factors related with enuresis (n=51).

Risk factors	Total (n)	Percentages (%)
Boys (%)	30	58.8
Girls (%)	21	41.2
Daytime symptoms (any)	45	88.2
Storage symptoms	19	43.1
Bladder overactivity	26	51
Cystitis symptoms	5	9.8
Difficulty in arousal	27	52.9
Low sp. gravity	28	54.9
Spina bifida	19	37.25
Low bladder capacity	26	51
Family history	21	41.2
Constipation	2	3.9
Documented UTI	3	5.9
Sleep disordered breathing	7	13.7
Low income	31	60.78

Table 4: Characteristics of MNE and NMNE children.

Characteristics	MNE (n=7)	NMNE (n=33)	p value
	N (%)	N (%)	
Males	5 (71.42)	21 (63.63)	0.2776
Females	2 (28.58)	15 (36.37)	
Difficult to arouse	4 (57.14)	18 (54.54)	0.9007
Low specific gravity	6 (85.71)	18 (54.54)	0.1346
Spina bifida	4 (57.14)	13 (39.39)	0.3936
Low bladder capacity	5 (71.42)	16 (48.48)	0.2766
Family history	4 (57.14)	15 (36.37)	0.3147

Enuresis is common among younger children and its frequency decreases with increasing age. The prevalence of enuresis among 5-12 years old is reported as between 1.4 to 28% in most studies.[2,3] In our study, primary enuresis found in 84% of cases while secondary 16%. Since the present study is a hospital-based study, the age at presentation does not reflect the true prevalence. The mean age at presentation of 8.75 years is similar to Robson et al whose study is also a similar study.[12]

The prevalence of NE is 1.5-2 fold more common among boys than among girls.[13] Similar observation was also observed in the study. When comparing the MNE and NMNE group of enuretic children, this difference in gender was observed. Similar observations were also noticed in the studies of Nasir et al.[14]

Family history of enuresis was present in 41.2% of children. This was comparable to Ozden et al, who showed a positive family history in 44.9 % of children (n=105).[15] No significant difference between MNE and NMNE children was observed in terms of family history. This was in accordance with the findings of Iduoriyekemweni et al.[16]

Day time symptoms were observed in 88.2% of patients which was comparable to the study done by Robson et al where daytime symptoms were found in 84.1% of patients.[12]

Spina bifida was present in 37.25% of patients in the present study. This is comparable to the data by Kumar et al who described 37% i.e. 18 of their 48 patients had spina bifida.[17]

Difficulty in arousability was found in 52% of patients. Wide variation is found among literature. This may be because of various parameters/scales used to assess arousability. Most studies however conclude that enuretics are deep sleepers.[18,19]

Low bladder capacity is more in NMNE patients compared to MNE children. This was in accordance with the findings of Naseri et al.[14] In his study, detrusor instability or decreased bladder compliance was less in 49% of patients with MNE than 79% with NMNE.

Low income was found to be associated in 60.78% of children. But review of literature shows conflicting reports about association of socio-economic status with enuresis. This may be due to the demographic factors in the sampling of patients.[19] In the present study the low-income group is higher as our hospital is a government Hospital catering mainly to such sections of the society. The rate of other risk factors such as sleep disordered breathing, constipation, documented UTI and post void residual urine is very low in our study precluding any meaningful comparison with older studies.[20]

One limitation of this study is the low number of patients. Despite the small sample size, 4 statistically significant factors that differentiate Secondary Enuresis from Primary Enuresis were identified. Another limitation of this study is the selection of patients from a referral centre (tertiary care hospital) rather than from primary care level /community. The selection bias from relying on a referral practice to accumulate sufficient numbers of children with enuresis may be unavoidable. This study is a preliminary investigation. Consequently, the power of negative findings is limited. Larger controlled community-based studies are needed to establish the findings.

CONCLUSION

Though enuresis is a common illness of childhood and is often neglected in some cases. The factors related the

prevalence of the disorder is multifactorial and it becomes complex when physical and psychological factors are involved. Hence, when deciding the treatment, it is compulsory to keep various factors in mind by the physician. Primary and secondary enuresis show many similarities in presentation while the few differences present show the difference in causes for secondary enuresis. MNE and NMNE have no differences in the presentation and probably represent the spectrum of a same disorder. The child as a whole along with his family and the environment surrounding him must be analysed for the effective treatment of enuresis.

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