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Original Research Article

Study of Nocturnal Enuresis in Children of South Karnataka

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Abstract

Background: Nocturnal enuresis in children is the result of emotional problems in the majority of them. Hence, the cause of NE has to be ruled out as either organic or emotional.

Method: A midstream morning urine sample was collected and examined within 30 minutes for proteinuria, glucosuria, and infection. An abdominal ultrasound was carried out for a bladder volume and bladder capacity study. Behavioral therapy, i.e., fluid restriction, star charting, lifting and waking, bladder retention exercise, and counseling for psycho-social factors, was carried out. Monthly follow-up for at least six months was done.

Results: In the clinical manifestation, 23.3% daily bed wetting, followed by 18.3% urgency and 15% frequency, was noted. In the study of comorbidities, 16.6% disturbed family followed by 15% poor attention is studied, and at least 3.3% congenital anomalies are noted. In the comparative study of non-pharmacological results, relapse was significant in pharmacological results.

Conclusion: In the present pragmatic study, it is proved that stressful conditions of children lead to phobia and anxiety, resulting in nocturnal enuresis.

Keywords: Bed Wetting, Behaviour Therapy, Emotional Disorder, Neurogenic Bladder.

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Introduction

Nocturnal enuresis (NE) is an emotional and social problem in children. It is an involuntary loss of urine at night in the absence of physical disease [1]. It is also known as nighttime incontinence or bedwetting. NE may be primary or secondary; children who have no prior period of sustained dryness are considered to have primary NE (persistent) and the recurrence of nighttime wetting after six months or longer of dryness is referred to as secondary (regressive) [2].

Another classification of NE is based on the presence or absence of other symptoms and is defined as monosymptomatic (uncomplicated) NE, in which there are not any other symptoms related to the gastrointestinal or urogenital systems, and polysymptomatic (complicated), in which it is associated with daytime symptoms such as urgency, frequency, constipation, or encopresis [3]. Prevalence of NE decreases with increasing age and is extremely rare in female children. Six- to seven-year-old children are at high risk of NE due to neurological abnormalities, and those above 6 to 7 years have NE due to poor marital adjustment of parents and low rating with social contacts [4]. Hence, an attempt is made to evaluate the manifestations and co-morbidities of NE in children of both sexes.

Material and Method

60 (sixty) children aged between 6 to 10 years who regularly visited paediatries department, Oxford Medical College, Hospital and Research Centre, Yadavanahalli, Bangalore-562107, were studied.

Inclusion Criteria: Children with nocturnal enuresis during the study period were enrolled. DSM-IV criteria are used to define children with nocturnal enuresis (NE). The parents or guardians who gave their consent for the study were selected.

Exclusion Criteria: Children with a history of previous treatment for more than 4 weeks. Degenerative progressive neurological diseases, mental retardation, slow learners, and learning disabilities. Any structural or functional urinary abnormalities, diabetes mellitus, diabetes insipidus, or patients exhibiting incontinence during the day were excluded.

Method

A detailed history was noted of the onset of complaints, other urinary complaints, family

history, toilet training, psychological history in them with reference to scholastic performance, any conflicts between parents, marital discord, the arrival of a new baby, and any adjustment problems at home.

Mid-stream morning sample was collected and examined within 30 minutes for proteinuria, glycosuria, and infection. If the child was found to have evidence of a UTI, appropriate antibiotics were administered, and then the child was recruited for the study. An abdominal ultrasound for bladder volume and bladder capacity was measured (normal capacity would be given by formula).

[(Age x year +2) x 30]

Behavior therapy was given as per the following protocol:

1) Fluid restriction: It was advised to withhold fluid intake (water, milk, cold drinks, etc.) for at least 2 hours before going to bed.
2) Star charting: the dry nights of the children were noted and rewarded.
3) Lifting and walking: Taking the child to the bathroom at night for passing urine.
4) Bladder retention exercises: The child was asked to pass his urine whenever he has a desire to micturate. Initially the bladder holding was five (5) minutes, which was gradually increased to 45 minutes.
5) Counseling: If any associated psychological factors were found to be observed (present), the child and family were counselled.

Patients were followed up monthly for a period of 6 months or till cured, whichever came earlier. The child having achieved 14 continuous dry nights during a month was considered as cured.

The duration of the study was from April 2024 to May 2025.

Statistical Analysis: Various clinical manifestations, co-morbidity comparisons of non-pharmacological and pharmacological trials, and results for NE were classified with percentages. The statistical analysis was carried out using SPSS software. The ratio of male and female neonates was 3:1.

Observation and Results

Table 1: Clinical manifestations of the nocturnal enuresis: Symptoms – 9 (15%) had frequency, 11 (18.3%) had urgency, 8 (13.3%) weekly (twice or thrice), 14 (23.3%) daily bed welting, 6 (10%) pain while passing, 5 (8.3%) abdominal straining, 7 (11.6%) specific situation.

Table 2: Study of co-morbidities: 5 (8.3%) constipation/soiling, 9 (15%) poor attention, 4 (6.6%) learning difficulty, 6 (10%) complex behavior, 7 (11.6%) emotional disorder, 3 (5%) diabetes mellitus 10 (16.6%) disturbed family, 7 (11.6%) urinary tract infection (UTI), 4 (6.6%) detrus over activity, 3 (5%) neurogenic bladder, 2 (3.3%) congenital anamolies.

Table 3: comparison of efficacy of non-pharmacological and pharmacotogial trials and results for treatment of nocturnal enuresis.

- Dry bed training: 65% response, 35% relapse, Alarm 50% response rate 10%, relapse rate 50% motivation therapy 20% and 3% relapse
- Desmopressin: 50-55% response rate, 40-45% relapse rate.
- Imipramine: 30-50% response rate, 70-90% relapse rate oxy but an in, 35-60% response rate, 40% relapse rate.

Table 4: Comparison of present clinical trials with desmopression in previous studies.

Table 1: Clinical manifestation of the nocturnal enuresis

Sl. No	Symptoms	Number	Percentage (%)
1	Frequency	9	15
2	Urgency	11	18.3
3	weekly (twice or thrice)	8	13.3
4	Daily bed wetting	14	23.3
5	Pain while passing	6	10
6	Abdominal straining	5	8.3
7	Specific situation	7	11.6

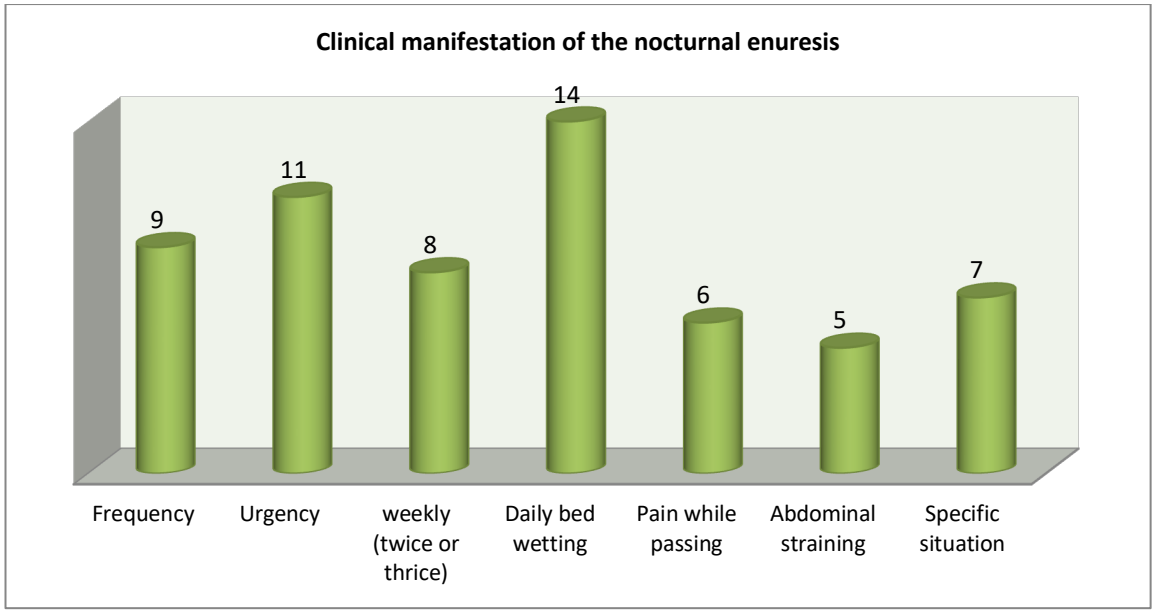

Figure 1: Clinical manifestation of the nocturnal enuresis

Table 2: Co-morbidities of nocturnal Enuresis

Sl. No	Particular	No. of patients	Percentage (%)
1	Constipation/soiling	5	8.3
2	Poor attention	9	15
3	Learning difficult	4	6
4	Complex Behaviour	6	10
5	Emotional disorder	7	11.6
6	Diabetics mellitus	3	5
7	Disturbed family	10	16.6
8	UTI (urinary tract infection)	7	11.6
9	Detrusor over activity	4	6.6
10	Neurogenic bladder	3	5
11	Congenital anomalies of uro-genital system	2	3.3

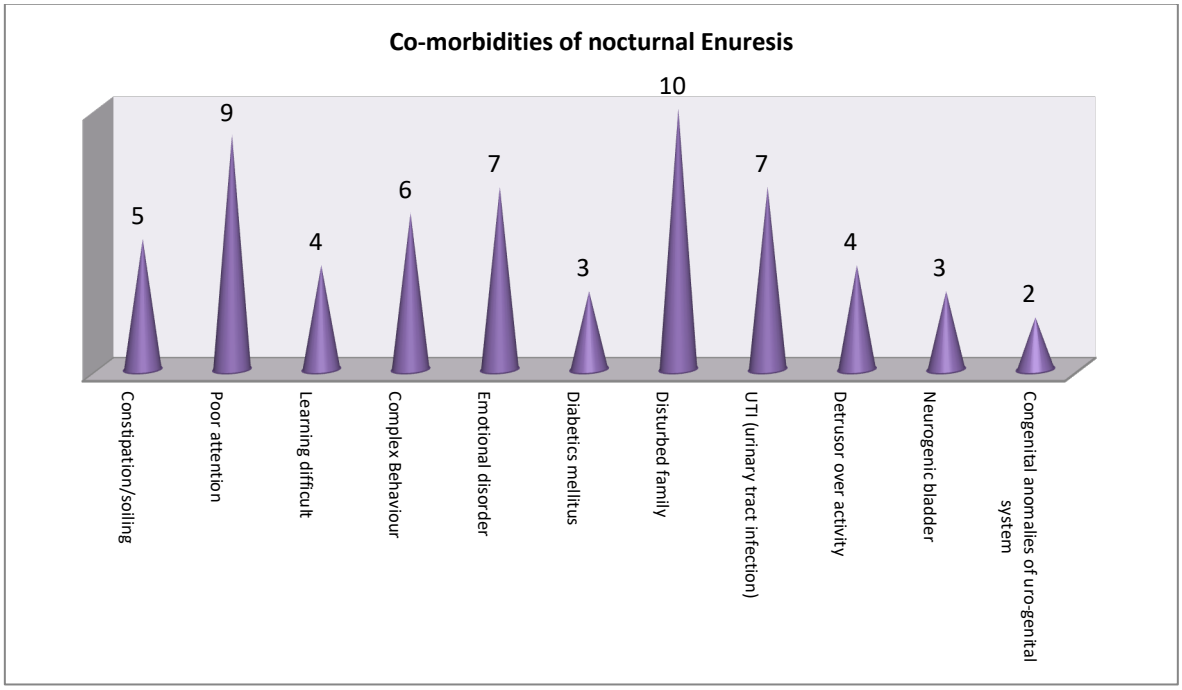

Figure 2: Co-morbidities of nocturnal Enuresis

Table 3: Comparison of efficacy of non-pharmacological and pharmacological trials and results for treatment of nocturnal enuresis

Therapy	Response rate (percentage)	Relapse rate (percentage)
Dry bed training	65	35
Alarm	50	10-50
Motivation therapy	20	3
Desmopressin	50-55	40-45
Imipramine	30-50	70-90
Oxybutanin	35-60	40

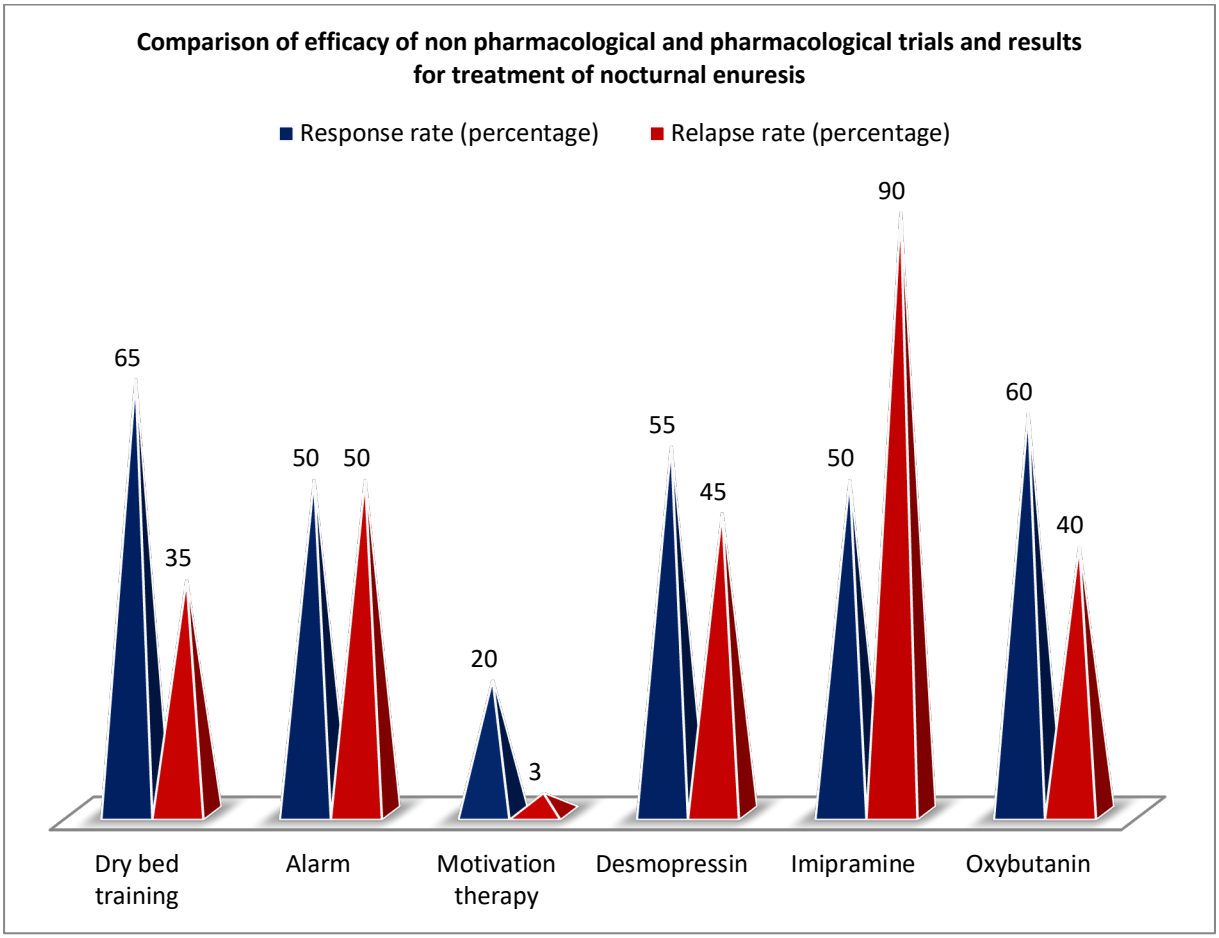

Figure 3: Comparison of efficacy of non-pharmacological and pharmacological trials and results for treatment of nocturnal enuresis

Table 4: Present comparative clinical trials with desmopressin in previous studies

Authors and year	Study design	Treatment	Results
Skoog (1997)	Double blind placebo controlled	Oral desmopressin 0.2, 0.4, 0.6 mg or placebo bed time	Smopressin 0.6 mg significant reduced wet night <50% decreased in wet nights was observed in 83%, 79% and 64% patients recurring placebo and 0.2, 0.4, 0.6 Demsopreein responded
Schmon (2001)	Double blind placebo controlled	Phase-1 one dose 2 weeks phase-II placebo wash out for 2 week followed by dose titration for 8 week	Significant reduced wet nights compared to placebo 44% 2 weeks with doses 0.2 and 0.4 mg mild to moderate side effect
Present study (2026)	Double bind placebo controlled	Oral desmopressin 0.3, 0.4, 0.6 placebo	<45 decreased in wet night was observed 80%, 75%, 65 patients receiving placebo and 0.3m/0.4/0.6/1m/ desmopressin respectively

Discussion

In the study of clinical manifestation, 14 (23.3%) had daily bedwetting, 11 (18.3%) had urgency, 7 (11.6%) had specific situations, and at least 5 (8.3%) had abdominal straining (Table 1). The majority of co-morbidities were 10 (16.6%) disturbed families, 9 (15%) had poor attention from family members, 7 (11.6%) had emotional disorders, 7 (11.6%) had urinary tract infections, and 2 (3.3%) had congenital anomalies of the urogenital system (Table 2). In the comparison of efficacy of non-pharmacological and pharmacological trials and results, the relapse rate was higher in pharmacological therapies (Table 3). Moreover, there was a clinical trial of desmopressin, and compared with previous studies, it had a significant response (Table 4). These findings are more or less in agreement with previous studies [5,6,7].

UTI, neurogenic, and DM cause transient urethral obstruction, incomplete voiding, spontaneous bladder contraction, and increased urination at night, which can be confused with nocturnal enuresis [8]. Moreover, it differentiates primary enuresis (PNE) from secondary enuresis or daytime incontinence with nocturnal incontinence in children [9]. Congenital anomalies included ectopic ureter, unascended kidney, and horseshoe-shaped kidney. UTI is detected through urine analysis and urine culture. Secondary enuresis can be identified by testing for elevated serum glucose, blood urea nitrogen, and creatinine levels and low thyroid-stimulating hormone levels.

In the over activity of the detrusor, a urodynamic study is required. Complex and emotional behavior in children includes bruxism, nail biting, thumb sucking, speech defects, and poor attention and learning difficulty. Such abnormalities are mainly associated with disturbed families. Western studies have reported that nocturnal enuresis is hereditary in 50% of children [10].

Apart from the disturbed family, a parent's attitude of anger, punishment, or rejection will also result in PNE. It can also be hypothesized that nutritional status during pregnancy aggravates the chromosomal aberration of the fetus because genetic factors are predominantly responsible for PNE, or secondary nocturnal enuresis.

Because of childhood complex attitudes and emotional disorders, children will be diagnosed as schizophrenic when they attain the age of adults (18 to 20 years). Hence, nocturnal enuresis due to emotional outbreaks can be a predictor of schizophrenia in adulthood.

Summary and Conclusion

The present study of nocturnal enuresis in the children aged between 6-10 years has pathophysiological and psychological factors, which is quite useful to pediatricians, psychiatrists, and urologists to rule out the exact cause. Although nocturnal enuresis is an idiopathic disease, it warrants further study of genetic, nutritional, psychotherapy, hormonal, and neurological factors because little is known about exact formation, tolerance and quantum voiding of urine.

Limitation of study: Owing to remote location of research centre, small number of patients, lack of latest techniques we have limited finding and results.

This research work was approved by the ethical committee of Oxford Medical College, Hospital and Research Centre, Yadavanahalli, Bangalore-562107.

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