

Bedwetting in adolescent girls staying at residential school

Shyam Mohan¹, RB Nerli^{2*}, Shridhar Ghagane², Shreya Bose³

¹3rd year Resident in mch Urology, KLE University, Belgaum, India

²Department of Urology, KLE University, Belgaum, India

³ Department of Pathology, KLE University, Belgaum, India

Received: 09-02-2021 / Revised: 15-03-2021 / Accepted: 06-04-2021

Abstract

Background and objectives:Nocturnal enuresis (NE) is a common, yet underreported problem among school children which has an impact on the child's psychology causing anxiety and social stigma. Nocturnal enuresis is classified as primary or secondary and monosymptomatic or non monosymptomatic. It can be the presenting symptom of urinary tract infection, underlying neurological disorder (spina bifida, epilepsy), vesicoureteric reflux, posterior urethral valve or diabetes mellitus. Thus, the present study was undertaken to assess the bedwetting among the girls during a routine school annual health check-up.**Methodology:**This study was conducted as a part of routine annual health check-up of girls staying in a residential school by a female physician. A detailed history regarding bedwetting was noted and physical examination was done in children with complaints of bedwetting. The children were evaluated regarding the risk factors associated with NE and scholastic performance as well as stress and the stigma associated with it on an outpatient department basis and were asked to follow up in a bed wetting clinic in our hospital.**Results:**A total of 342 girls of a residential school underwent health check-up for general fitness conducted by the physicians of our hospital. History of NE was noted in 37 girls (10.82%). Most of the girls (62.16%) had secondary NE and 37.84% had primary NE. The diagnosis of NE was common among the girls aged 12 years (40.54%) and the mean age was 12.00±1.40 years. Most of the girls reported symptoms of constipation (48.65%). Eighteen girls had symptoms suggestive of attention deficit hyperactive disorder (ADHD) and stress due to NE was noted in 40.54% of the girls. Furthermore, 13 (35.14%) girls were average performers.**Conclusion and interpretation:**Nocturnal enuresis is a significant paediatric health problem and there is high prevalence of monosymptomatic NE in school going girls. Further it affects the scholastic performance of the child and also likely to induce stress.

Keywords:Attention deficit hyperactive disorder; Nocturnal enuresis; Scholastic performance

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Enuresis is a prevalent and potentially distressing experience for children and their parents. Nocturnal enuresis (NE) is a benign condition, yet needs treatment to relieve the child and parents of the accompanying anxiety and the stigma attached to it[1]. The Diagnostic Statistical Manual (DSM) for mental disorders uses the term enuresis for repeated voiding of urine into clothing, occurring at least twice a week for at least three consecutive months, in children over 5 years of age in the absence of congenital and acquired defects of central nervous system[2,3]. Enuresis in children without any other Lower Urinary Tract (LUT) symptoms (nocturia excluded) and without a history of bladder dysfunction is defined as monosymptomatic enuresis. Other children with enuresis and any other LUT symptoms are said to experience non mono-symptomatic enuresis. LUT symptoms relevant to this definition are increased/decreased voiding frequency, daytime incontinence, urgency, hesitancy, straining, a weak stream, intermittency, holding manoeuvres, a feeling of incomplete emptying, post-micturition dribble and genital or LUT pain[3,4]. Nocturnal enuresis (night time wetting) is more common in boys, whereas diurnal enuresis (daytime wetting) is more common in girls[5]. Studies report the prevalence of enuresis as 12-25% amongst four-year-olds, 8-10% amongst eight-year-olds and 2-3% amongst 12-year-olds[6].

Enuresis is seen worldwide across all races and cultures. It is a common problem among school children and the reported prevalence varies across studies. These inconsistencies often arise due to imprecise definitions[7]. Enuresis has no clear etiology; it is hypothesized to be related to genetics, sleep arousal dysfunction, maturational delay, stress, poor toilet training, altered smooth-muscle physiology, and occasionally organic causes. Bedwetting can be diagnosed in 5 year-olds and beyond; clinically, it is generally left untreated until the children are 7-8 years old[8]. Primary nocturnal enuresis consists of never having established urinary continence at night, while secondary nocturnal enuresis refers to the development of enuresis after a period of established urinary continence[5]. Nocturnal enuresis (night time wetting) is more common in boys, whereas diurnal enuresis (daytime wetting) is more common in girls. It is a leading cause of childhood morbidity worldwide. Though it is widely acknowledged in all cultures, information on its true disease state is stigmatizing[9]. Few published studies in India have reported the incidence of enuresis to be 4-14 % in school children[7,10]. Enuresis has been noted to be an under reported problem and even parents of children do not see it as source of concern[7]. Children with nocturnal enuresis are subject to shaming and embarrassment, especially in a residential school, which has an impact on their morale. Further, few studies have focussed on bed wetting among adolescent girls in residential schools, hence this study was sought to determine the bedwetting among the girls during a routine school health check-up.

Methodology

This hospital based prospective descriptive study was undertaken under the Department of Urology of a tertiary care

*Correspondence

Dr. RB Nerli

Department of Urology, KLE University, Belgaum, India

E-mail: voveran79@gmail.com

teaching hospital situated in north Karnataka, India from October 2019 to December 2019. A total of 342 girls of a residential school underwent health check-up for general fitness conducted by the physicians of our hospital. Prior to the commencement, permission was taken from the school head. A predesigned and pretested questionnaire was administered to all students and was instructed by the school teachers to fill the details. This questionnaire was also sent to the parents via email. The questionnaire was designed to cover a detailed history regarding bedwetting and was noted as a part of general questions related to health, diet, sporting activities, sleep, bowel movements and urinary voiding patterns. The physician obtained the relevant information for the questionnaire from the students through an interview. Further, physical examination was done under the supervision of a female physician in all children with complaints of bedwetting, which included observation of gait, examination of spine and abdomen. The children identified to have nocturnal enuresis were asked to attend the bed wetting clinic in our set up along with their parents for further management. These children were also screened for ADHD by a psychiatrist using the ADHD-RS4 scoring system. They were counselled regarding various therapeutic options for both nocturnal enuresis and ADHD. The data obtained was coded and entered into Microsoft Excel Worksheet. The data was analyzed using SPSS statistics software version 20.0. The categorical data was expressed in terms of rates, ratios and proportions and the continuous data was expressed as mean \pm standard deviation (SD).

Results

In the present study out of 342 girls, NE was present among 37 (10.82%) girls. Out of 37 girls with NE, Secondary NE was evident in 23 (62.16%) girls and primary in 14 (37.84%) girls. The age ranged between 11 to 16 years and most of the girls with NE were aged 12 years (40.54%) (Table 1). The mean and median age of girls with NE was 12.00 ± 1.40 and 12 years. Most of the girls reported history of constipation (48.65%) followed by stressful events (45.95%), family history of enuresis (43.24%), scolding, tea drinking habits, more than one glass of water in the evening (40.54% each) and history of UTI (10.81%) (Table 2). With regard to scholastic performance, most of the girls with NE attained C grade (35.14%) (Table 3) and stress due to NE was reported by 22 girls (59.46%) (Table 3). The symptoms of ADHD were noted in 18 girls (46.365%) with NE (Table 2). There was no association of nocturnal enuresis with menarche.

Discussion

The present study showed higher rate of NE among the girls of a residential school as high as 10.58% which translates into every one out of 10 girls are likely to have NE. The incidence of NE observed in the present study was well within the range reported by the other published studies from India that is between 4 to 14% in school children [7,10], and was strongly in agreement with the study by Solanki AN et al [5] (2014) who reported incidence of nocturnal enuresis as 11.13% that is 140 children among 1258 school children. The incidence of enuresis varies widely in various countries. These differences between countries may arise from factors such as cultural, racial, environmental, and socio-economic conditions. Accordingly, a study by Srivastava S. et al [10] (2012) to determine the incidence of primary monosymptomatic nocturnal enuresis (PMNE) found PMNE in 12.6% which was slightly high compared to the present study while high prevalence rates, as high as 28.6%, were reported in a study by Aljefri HM, et al [11] from Yemen in 2013.

In the present study secondary NE was more prevalent (62.16%) than primary NE (37.84%). On the contrary, Gunes A et al. (2009) in their study from Turkey reported primary enuresis to be common, that is (60.7%) than secondary (37.2%) [12]. Bakhtiar K. et al. (2014) in their study showed that 8% of the children had nocturnal enuresis with higher frequency of primary nocturnal enuresis (5.2%) than secondary nocturnal enuresis (2.8%) [13].

In the present study the mean age of girls with NE was 12.00 ± 1.40 years. Further, NE was widely prevalent among the girls who were aged 12 years while only few girls aged 15 and 16 years (5.41%) had NE. These observations suggest, a declining trend of NE with increase in age, a finding consistent with other studies in the literature which state that, number of children with enuresis decreased as the age increased (14-16). It is also reported that, NE is mostly expected to improve spontaneously, its decrease with age is thought to be mostly due to spontaneous improvement [17]. The mean age observed in the present study was comparable with the study of Gunes A et al [12] and Aljefri HM, et al [11] who reported mean age of 11.21 ± 2.48 years and 11.5 ± 2.7 years respectively.

In the present study, the common risk factor was constipation reported by nearly half (48.65%) followed by stressful events (45.95%) and family history of enuresis (43.24%). These observations were partly in agreement with a study by Gunes A et al [12] (2009) who reported family history of enuresis in 42.2% and constipation in 24.2% of the children with NE and the study by Solanki AN et al. (5) (2014) reported family history in 62%. In the present study mono-symptomatic nocturnal enuresis defined as bedwetting in the absence of accompanying symptoms of the lower urinary tract, such as urgency, daytime incontinence and urinary flow anomalies was noted in few girls (10.81%). On the contrary, a study by Gunes A et al. (2009) reported history of UTI in 21.6% of the children with NE. Recently, Reddy NM et al [18] (2017) reported that, enuresis may occur without lower urinary tract symptoms or a history of bladder dysfunction or with lower urinary tract symptoms such as change in voiding frequency, daytime wetting, dribbling, and holding manoeuvres. In this study, nearly one third of the children with NE attained C grade (35.14%). It was also observed that, more than half of the girls with NE had anxiety and social stigma (59.46%). These observations suggest that girls with NE are likely to develop anxiety and social stigma resulting in underperformance with respect to scholastic achievements. These observations were comparable to the study by Srivastava S. et al [3] (2012) who reported that, stress in children due to enuresis was significant. Another study by Aljefri HM, et al. (2013) reported poor learning performance in 27.2% of the children with NE [11].

Increasing number of studies show increased levels of psychological problems in children with enuresis [12,19]. Childhood enuresis is a common socially disruptive problem resulting in chronic stress, low morale and poor relation of the children with the parents and their peers. It may be both a result and cause of anxiety. Hence, both genetic as well as psychological factors contribute to nocturnal enuresis in children [18].

In the present study, more than one third of the girls with NE had symptoms of ADHD (46.36%). It is reported that, urinary and bowel disorders can also be associated with ADHD in children (10-12). Further, it was also found that urinary disorders such as enuresis can be related to the onset and worsening of symptoms in ADHD patient [14]. In 2009, a study by a Shreeram et al, [20] recommended that it is better to study the children with NE for ADHD. Accordingly, in the present study, the girls with NE underwent assessment for the diagnosis of ADHD by the female psychiatrist and the symptoms of ADHD were present among nearly half of the girls with NE (18 girls, 46.36%). Recently Yousefichaijan P. et al. (2016) also found that ADHD inattentive type in children with PMNE was significantly more common than that in healthy children and recommended psychological counseling mandatory in children with PMNE [21]. In 2012, Wolfe – Christensen et al, found a direct correlation of increasing mental-social problems with increasing severity of urinary disease during screening of psychological problems in children attending urology clinics [22].

There are special concerns regarding the treatment of nocturnal enuresis in a residential school. Non-pharmacological interventions like dry bed training, enuresis alarm and motivational therapy require the participation of parents to make it effective.

However, it is difficult to implement these measures in a residential school. In such situations, it is essential for the child counsellor to assume the role of the guardian and help them deal with this stressful situation. Overall, the present study showed that, NE is a common disorder among the girls residing in residential school. Constipation,

stress, ADHD and family history are the important risk factors in the development of NE. Further, NE is likely to result in anxiety and social stigma affecting the scholastic performance of the children. Hence it must be treated, as it is a disease that can result in socio-psychological problems and low school performance.

Table 1: Distribution of age among the girls with nocturnal enuresis

Distribution (n=37)		
Age (Years)	Number	Percentage
11	9	24.32
12	15	40.54
13	6	16.22
14	3	8.11
15	2	5.41
16	2	5.41

Table 2: Distribution of girls with nocturnal enuresis according to the risk factors

Distribution (n=37)		
Risk factors	Number	Percentage
Constipation	18	48.65
Stressful events	17	45.95
Family history of enuresis	16	43.24
Scolding	15	40.54
Tea drinking Habits	15	40.54
Drink of more than one glass of water in the evening	15	40.54
History of UTI	4	10.81
ADHD	18	46.35

Table 3: Impact of NE

Parameter	Number	Percentage
Scholastic Performance		
A	5	16.22
B	9	24.32
C	13	35.14
D	10	24.32
Stress	22	59.46

Questionnaire:
Subject identification number
Date:

Class:

Demographic data

Gender: females

Age: _____ years

History with special emphasis of nocturnal enuresis

Type of school: Boarding school

Home conflict: Yes /No

Scolding: Yes/No

Family H/o enuresis: Yes/No

History of UTI : Yes/No

Constipation: Yes /No

Daytime bed wetting: Yes/No

Dry night period > 6 months:

Tea drinking habits: Yes/No

Quantity and type of fluid intake?

Drinks more than one glass during the evening?

Drinks during the night?

Stressful events: Yes/No

Frequency of wetting: Every night/3-5 nights per week/2 nights per week/1 night per week/1 night per month

Illness and/or malformation of kidneys and/or urinary tract/spinal cord: Yes/No

Did the child stop bedwetting if they aroused to void: Yes/No

Symptoms suggestive for underlying bladder dysfunction

 Leakages of urine during the day

 Drops of urine in the underpants

Very wet underpants
 Frequency of leakage (N = episodes per day)
 History of daytime incontinence over 3½ years of age
 Urinary frequency ≥8/day: Yes/No
 Psychological behavior (established cases of ADHD, history given by parents questionnaire): Yes/No.

General examination findings:

Height: _____ cms.

Weight: _____ Kg

Genital examination including examination of underwear

Physical abnormalities: labial agglutination/signs of fecal incontinence

Neurological examination: inspection of lumbosacral spine for Occult spinal dysraphism: dimple, lipoma, hypertrichosis, or sacral agenesis

Diagnosis

Nocturnal enuresis: Yes/No

If Yes, Primary/Secondary; Monotonous/non monotonous (Nocturnal or diurnal)

Effects of nocturnal enuresis:

Scholastic performance: Grades A/B/C/D/E

Stress in children due to enuresis: Yes/No

References

- Kanitkar M, Dua T. Nocturnal enuresis. *Indian J Pediatr.* 2003;70(3):251-5.
- Joinson C, Heron J, Emond A, Butler R. Psychological problems in children with bedwetting and combined (day and night) wetting: A UK population-based study. *J Pediatr Psychol.* 2007; 32(5):605-16.
- Srivastava S, Srivastava KL, Shingla S. Prevalence of monosymptomatic nocturnal enuresis and its correlates in school going children of Lucknow. *Indian J Pediatr.* 2013;80(6):488-91.
- Nevés T v GA, Hoebeke P, Hjalmas K, Bauer S, Bower W, et al. The standardization of terminology of lower urinary tract function in children and adolescents: Report from the Standardization Committee of the International Children's Continence Society. *J Urol* 2006;176:314-24.
- Solanki AN DS. Prevalence and risk factors of nocturnal enuresis among school age children in rural areas. *Int J Res Med Sci* 2014(2):202-5.
- Devlin JB. Prevalence and risk factors for childhood nocturnal enuresis. *Ir Med J.* 1991;84(4):118-20.
- De Sousa A, Kapoor H, Jagtap J, Sen M. Prevalence and factors affecting enuresis amongst primary school children. *Indian journal of urology : IJU : journal of the Urological Society of India.* 2007;23(4):354-7.
- Logan AC, Lesperance F. Primary nocturnal enuresis: omega-3 fatty acids may be of therapeutic value. *Med Hypotheses.* 2005;64(6):1188-91.
- Iduoriyekemwen NJ, Ibadin MO, Abiodun PO. Survey of childhood enuresis in the Ehor community, the EDO State, Nigeria. *Saudi J Kidney Dis Transpl.* 2006;17(2):177-82.
- Jiloha RC MRAesoppiscCPQ. An epidemiological study of psychiatric problems in primary school children. *Child Psychiatry Q.* 1981;14:112.
- Aljefri HM, Basurreh OA, Yunus F, Bawazir AA. Nocturnal enuresis among primary school children. *Saudi J Kidney Dis Transpl.* 2013;24(6):1233-41.
- Gunes A, Gunes G, Acik Y, Akilli A. The epidemiology and factors associated with nocturnal enuresis among boarding and daytime school children in southeast of Turkey: a cross sectional study. *BMC Public Health.* 2009;9:357.
- Bakhtiar K, Pournia Y, Ebrahimzadeh F, Farhadi A, Shafizadeh F, Hosseinabadi R. Prevalence of nocturnal enuresis and its associated factors in primary school and preschool children of khorramabad in 2013. *Int J Pediatr.* 2014;2014:120686.
- Spee-van der Wekke J, Hirasig RA, Meulmeester JF, Radder JJ. Childhood nocturnal enuresis in The Netherlands. *Urology.* 1998;51(6):1022-6.
- Serel TA, Akhan G, Koyuncuoglu HR, Ozturk A, Dogruer K, Unal S, et al. Epidemiology of enuresis in Turkish children. *Scand J Urol Nephrol.* 1997;31(6):537-9.
- Kalo BB, Bella H. Enuresis: prevalence and associated factors among primary school children in Saudi Arabia. *Acta Paediatr.* 1996;85(10):1217-22.
- Unalacak M SA, Aktunç E, Demircan N, Altın R.; enuresis nocturnal prevalence and risk factors among school age children in northwest turkey. *Eur J Gen Med.* 2004;1(3):21-5.
- Reddy NM, Malve H, Nerli R, Venkatesh P, Agarwal I, Rege V. Nocturnal Enuresis in India: Are We Diagnosing and Managing Correctly? *Indian J Nephrol.* 2017;27(6):417-26.
- Eapen V, Mabrouk AM. Prevalence and correlates of nocturnal enuresis in the United Arab Emirates. *Saudi Med J.* 2003;24(1):49-51.
- Shreeram S, He JP, Kalaydjian A, Brothers S, Merikangas KR. Prevalence of enuresis and its association with attention-deficit/hyperactivity disorder among U.S. children: results from a nationally representative study. *J Am Acad Child Adolesc Psychiatry.* 2009;48(1):35-41.
- Yousefichaijan P, Sharafkhan M, Salehi B, Rafiei M. Attention deficit hyperactivity disorder in children with primary monosymptomatic nocturnal enuresis: A case-control study. *Saudi J Kidney Dis Transpl.* 2016;27(1):73-80.
- Wolfe-Christensen C, Veenstra AL, Kovacevic L, Elder JS, Lakshmanan Y. Psychosocial difficulties in children referred to pediatric urology: a closer look. *Urology.* 2012;80(4):907-12.

Conflict of Interest: Nil**Source of support:** Nil