

Prevalence and correlates of nocturnal enuresis in the United Arab Emirates

Valsamma Eapen, MRCPsych, Abdulazim M. Mabrouk, MD.

ABSTRACT

Objectives: To determine the prevalence, socio-demographic correlates and associated psychopathology in children with enuresis.

Methods: A community survey of a stratified sample of 400 6-16 year old school children was carried out in the Al-Ain City, United Arab Emirates. Psychiatric disturbance, if any, was ascertained using the Rutter Parent Scale.

Results: Thirty-two out of the 400 children (8%) surveyed, reported wetting the bed at least once per week. More boys

were affected than girls, and 90% of those with enuresis were aged 6-11 years. Presence of enuresis was found to be associated with psychosocial stress in the family; large family size; a positive family history, poorer scholastic performance and presence of psychiatric disturbance as indicated by the Rutter parent score.

Conclusion: Our findings suggest that bed-wetting is a common problem among school children and that they need to be carefully screened for associated psychopathology.

Saudi Med J 2003; Vol. 24 (1): 49-51

Enuresis is defined as the occurrence of involuntary voiding at an age when voluntary control of micturition is expected. By the age of 3 years, nearly 75% of children attain night time dryness. Boys tend to be slower than girls in acquiring dryness. The term enuresis is usually used when wetting persists beyond the age of 6 years. It is not unknown for pediatricians and primary health workers to encounter children with night time wetting during routine consultations.¹ It is estimated that around 10-20% of 5-year-old children wet the bed at night. However, by adolescence only 1% continue to have this problem. Genetic factors have been postulated to play a role in the etiology² and a positive family history is noted in around 75% of cases.³ Further, evidence for the role of genetics comes from studies showing higher rates among first-degree relatives⁴ and higher concordance rates among monozygotic twins.⁵ Recent research has described molecular genetic heterogeneity in primary nocturnal enuresis with linkage

to chromosome 22q, 13q and 12q.⁶ Other etiological theories proposed include reduction in nocturnal functional bladder capacity or dysfunction,⁷ sleep related difficulties and changes in the sleep pattern,⁸ the concept of "deep sleeper" and lack of inhibitory cerebral control of reflex voiding during sleep as well as autonomic arousal prior to nocturnal micturition;⁹ endocrine abnormalities such as the failure of nocturnal increase in the plasma levels of antidiuretic hormone, vasopressin;¹⁰ electroencephalogram disturbances;¹¹ maturational lag and developmental delay;¹² as well as secondary to physical disorders associated with polyuria such as diabetes mellitus, diabetes insipidus, sickle cell trait, chronic renal failure, recurrent urinary tract infection for example. The role and nature of psychological factors associated with enuresis is controversial with some arguing that psychological disturbances in the child and psychosocial stressors in the family may be the result rather than the cause of bed-wetting. However, there is

From the Faculty of Medicine & Health Sciences (Eapen), United Arab Emirates University and the Department of School Health (Mabrouk), Al-Ain, *United Arab Emirates*.

Received 21st August 2002. Accepted for publication in final form 30th September 2002.

Address correspondence and reprint request to: Dr. Valsamma Eapen, Associate Professor, Faculty of Medicine & Health Sciences, United Arab Emirates University, PO Box 17666, Al-Ain, *United Arab Emirates*. Tel. +971 (3) 7672000. Fax. +971 (3) 7672995. E-mail: veapen@uaeu.ac.ae

some evidence to suggest that early childhood experiences, harsh toilet training practices and psychiatric disorders in the child per-say may be important in at least a proportion of children with enuresis.¹³ Whether it is primary or secondary, children with enuresis seem to be at a higher risk for having psychological disturbance.^{14,15}

The present study was undertaken to ascertain the prevalence of enuresis, and the nature of associated psychosocial factors in school aged children in Al-Ain, United Arab Emirates.

Methods. A stratified sample of 400 children aged 6-16 years (100 each of 6-7 year olds; 8-9 year olds; 10-11 year olds; and 12-16 year olds) were evaluated over a 3-month period, using a semi-structured interview schedule that enquired regarding the presence of enuresis and relevant details including frequency, whether primary or secondary, precipitating factors if any, presence of family history, whether treatment was received or not, nature of treatment and response to treatment. The questionnaire also had socio-demographic items such as age, nationality of the child, socio-economic status, family composition, number of children in the family, parental education and occupation, polygamy, consanguinity, psychosocial stressors as reported by the parent, parental loss or any other major life events, presence of physical illness and scholastic performance based on the final school report for the previous year. After obtaining informed consent, the parent (preferably the mother) was asked to complete the Rutter Behaviour Questionnaire (the parent version).¹⁶ This questionnaire including the Arabic version has been used worldwide and has been shown to have good reliability and validity.^{17,18}

Results. A total of 400 children were studied. There were 204 boys and 196 girls. The socio-demographic characteristics of the total sample are given in **Table 1**. Thirty-two children (8%) were reported to have bedwetting at least once per week. Of these 26 (6.5%) had been wetting more than twice per week and 18 (56.3% of the enuretics) had received treatment for their enuresis. There were 20 boys and 12 girls. Twenty-eight were aged 6-11 years and the remaining 4 were 12 years of age or more. The prevalence rate dropped 'with advancing' age; 15 (37.5%) were aged 6-7 years; 7 (17.5%) were aged 8-9 years; 6 (15%) were aged 10-11 years; 3 (7.5%) were aged 12-13 years and one child (2.5%) had the age above 13 years. A positive family history of enuresis was reported in 23 (72%) cases, of which half (12 cases) gave history of enuresis on both the maternal and paternal sides of the family. Discriminant function analysis with enuresis as dependent variable showed an association with psychosocial stressor as reported by the family (0.017), large family size (0.041), positive family history of enuresis (0.000) and poor scholastic performance (0.003).

Table 1 - General characteristics of the sample.

| Family and demographic characteristics | n | (%) |
|--|-----|--------|
| Nationality | | |
| UAE | 58 | (14.5) |
| Gulf | 19 | (4.8) |
| Arab | 313 | (78.3) |
| Asian | 5 | (1.2) |
| Other | 5 | (1.2) |
| Family composition | | |
| Nuclear | 342 | (85.5) |
| Extended | 49 | (12.3) |
| Single parent | 5 | (1.2) |
| Living with relatives | 4 | (1) |
| N of children in the household | | |
| ≤4 | 171 | (42.8) |
| 5-8 | 174 | (43.5) |
| >8 | 55 | (13.7) |
| Socio-economic status | | |
| High | 68 | (17) |
| Middle | 285 | (71) |
| Low | 48 | (12) |
| Father's occupation | | |
| Professional/skilled | 157 | (39.2) |
| Semiskilled | 161 | (40.2) |
| Unskilled | 67 | (16.8) |
| Unemployed | 15 | (3.8) |
| Polygamy | | |
| Father has more than one wife | 35 | (8.8) |
| Only one wife | 365 | (91.2) |
| Psychosocial stress | | |
| Yes | 34 | (8.5) |
| No | 366 | (91.5) |
| Developmental problems | | |
| Yes | 20 | (5) |
| No | 380 | (95) |
| Family history of enuresis | | |
| Yes | 25 | (6.2) |
| No | 375 | (93.8) |
| Consanguinity | | |
| Yes | 135 | (33.8) |
| No | 265 | (66.2) |
| Scholastic performance | | |
| Excellent | 257 | (64.2) |
| UAE - United Arab Emirates | | |

With regard to psychopathology as indicated by Rutter caseness (a score of 13 or more), enuresis was found to significantly correlate with the presence of behavioral disturbance (0.000).

Discussion. The Isle of Wight study in the United Kingdom found the prevalence rate of enuresis to be 10% among 5-7 year olds and 5% among 9-10 year olds.¹⁹ Our finding is consistent with that of Matteson²⁰ who reported that 8% of healthy children aged 7-15

years had nocturnal enuresis. An earlier study carried out in the United Arab Emirates (UAE) reported a prevalence rate of 5.5% among 6-12 year olds using a questionnaire survey.¹⁵ The lower rate observed in the above study may be due to the fact that the proportion of younger children in their sample was too small coupled by the use of questionnaires rather than semi-structured interviews. It may be that the parents under-report the problem when a questionnaire is used.

The association with behavioral disturbance noted in our study is in keeping with the findings of the above studies. A more recent prospective study observed that the risks of conduct problems, attention deficit problems and anxiety/withdrawal were increased among enuretics after the age of 10 years.²¹ Furthermore, Theunis et al²² reported that nocturnal enuresis has important negative effects on the self-esteem of children, which tended to improve with successful treatment. These authors also noted a significantly decreased perceived competence on scholastic skills for children with daytime and night time wetting as compared to those with nocturnal problems only. Chang et al²³ found that enuresis was associated with childhood behavioral problems, and in particular attention problems and aggressive behavior, lower social competence and school performance. Also their parents demonstrated more parenting stress. In this regard, our finding of a significant association with behavioral disturbance, poor scholastic performance and psychosocial stress is noteworthy. The association with large family size is also striking, as having more children in the household might make it more difficult for parents to give individualized attention and monitoring, including toilet training.

We found the rate of a positive family history to be 72%, which compares with that of an Italian study that found the rate to be 77%.³ The finding of a bilineal nature of the disease with positive family history from both the maternal and paternal sides of the family in our sample may be due to the high rates of consanguinity prevalent in this population;²⁴ the rate of consanguinity in the present sample was 34%. This is an interesting finding that deserves further exploration. Our study confirms the fact that enuresis is a common problem among healthy school children in the UAE and that it is associated with behavioral disturbance. It is not possible; however, to comment whether the associated psychopathology is the cause or the consequence.

References

- Alon U. Nocturnal enuresis. *Pediatr Nephrol* 1995; 9: 94-103.
- Bakwin H. The genetics of enuresis. In: Kolvin I, editor. Bladder control and enuresis. London (UK): William Heinemann; 1973. p. 73-77.
- Bartolozzi G, Boldrini A, Salmeri A, Vitali E. Evaluation and treatment of the enuretic child: eight years experience. *Pediatric Medicine and Emergency Chirurg* 1991; 13: 389-393.
- Wille S. Nocturnal enuresis; sleep disturbance and behavioural patterns. *Acta Paediatr* 1994; 83: 772-774.
- Bakwin B. Enuresis in children. *J Pediatr* 1961; 58: 806-819.
- Loeys B, Hoebeke P, Raes A, Messiaen L, De Paepe A, Vande Walle J. Does monosymptomatic enuresis exist? A molecular genetic exploration of 32 families with enuresis/incontinence. *BJU International* 2002; 90: 76-83.
- Yeung CK, Sit FK, To LK, Chiu HN, Sihoe JD, Lee E et al. Reduction in nocturnal functional bladder capacity is a common factor in the pathogenesis of refractory nocturnal enuresis. *BJU International* 2002; 90: 302-307.
- Wille S. Primary nocturnal enuresis in children: Background and Treatment. *Scand J Urol Nephrol Suppl* 1994b; 156: 1-48.
- Bader G, Neveus T, Kruse S, Sillen U. Sleep of primary enuretic children and controls. *Sleep* 2002; 25: 579-583.
- Rittig S, Knudsen UB, Norgaard JP, Pedersen EB, Djurhuus JC. Abnormal diurnal rhythm of plasma vasopressin and urinary output in patients with enuresis. *Am J Physiol* 1989; 25: 664-671.
- Campbell G, Young J. Enuresis and its relationship with electroencephalographic disturbances. *J Urol* 1996; 96: 947-949.
- Essen J, Peckham C. Nocturnal enuresis in childhood. *Dev Med Child Neurol* 1976; 18: 577-589.
- Shaffer D. Enuresis. In: Rutter M, Hersov L editors. Child and Adolescent Psychiatry: Modern Approaches. Oxford (UK): Blackwell Scientific Publications; 1985. p. 465-481.
- Warzak W. Psychosocial implications on nocturnal enuresis. *Clin Pediatr* 1993; special issue: 38-40.
- Swadi H. Nocturnal Enuresis and psychopathology: Associations in a community sample. *Arab Journal of Psychiatry* 1996; 7: 111-118.
- Rutter M, Tizard J, Whitmore K, editors. Education, health and behaviour. London (UK): Longmans; 1970.
- Elander J, Rutter M. An update on the status of the Rutter Parents' and Teachers' scales. *Child Psychology and Psychiatry Review* 1996; 1: 31-35.
- Eapen V, Al Ghazali LI, Salem B, Abou-Saleh MT. Mental health problems among school children in United Arab Emirates: Prevalence and risk factors. *J Am Acad Child Adolesc Psychiatry* 1998; 37: 880-886.
- Rutter M, Yule W, Graham P. Enuresis and behavioural deviance: some epidemiological considerations. In: Kolvin I, editor. Bladder Control and Enuresis. *Clinical and Developmental Medicine* 1973; 48/49: 137-147.
- Mattesson S. Urinary incontinence and nocturia in healthy school children. *Acta Paediatr* 1994; 83: 950-954.
- Fergusson D, Horwood L. Nocturnal enuresis and behaviour problems in adolescence: a 15 year longitudinal study. *Pediatr* 1995; 94: 662-668.
- Theunis M, Van Hoecke E, Paesbrugge S, Hoebeke P, Vande Walle J. Self-image and performance in children with nocturnal enuresis. *Eur Urol* 2002; 41: 660-667.
- Chang SS, Ng CF, Wong SN. Hong Kong Childhood Enuresis Study Group. Behavioural problems in children and parenting stress associated with primary nocturnal enuresis in Hong Kong. *Acta Paediatr* 2002; 91: 475-479.
- Bener A, Abdulrazzaq YM, Al Gazali LI, Micallef R Al-Khayat AI, Gaber G. Consanguinity and associated socio-demographic factors in the UAE. *Hum Hered* 1996; 46: 256-264.