



EDITORIAL

Nocturnal enuresis: a comorbid condition^{☆,☆☆}

Enurese noturna: uma condição comórbida

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Achieving continence is an important physiological and developmental milestone for all children; day- and night-time bladder control is normally achieved by the chronological age of 5 years. Nocturnal enuresis (NE), or night-time wetting, is the most common form of childhood functional incontinence. According to the International Children's Continence Society, NE is defined as intermittent incontinence that occurs during periods of sleep with a minimum of one episode per month for at least three months. Frequent enuresis occurs $\geq 4\times/\text{week}$ and infrequent enuresis, $< 4\times/\text{week}$. Subtypes include primary, secondary (relapse after a dry period of at least six months), and monosymptomatic NE (MNE); no lower urinary tract symptoms (LUTS), or bladder dysfunction, or non-monosymptomatic nocturnal enuresis (NMNE) in the presence of LUTS.¹

Underlying causal factors for NE are nocturnal polyuria and/or reduced nocturnal bladder capacity giving rise to the need to void during sleep. Superimposed difficulties of arousal and inability to wake result in bedwetting. Prevalence data from around the globe (including the Brazilian birth cohort presented by Mota et al. in this journal) reveals that enuresis rates reduce with age, from approximately 9.7% at 7 years to 5.5% at 10 years, suggesting maturational

delay factors in some children.^{2,3} This leads most parents to hope their children will "grow out" of their bedwetting. However, new statistical methods, using longitudinal latent class trajectory analysis, have clarified that in two historically distinct UK prospective population cohort studies (the 1946 MRC Health and Development cohort [$n=4755$] and the 1991/2 ALSPAC cohort [$n=10,818$]) that 34% of 4-year-old bedwetters were persistent enuretics at 15 years of age⁴ and 41% of 4.5-year-old bedwetters were persistent enuretics at 9.5 years of age,⁵ respectively. Moreover, in the latter study, if a patient had MNE or NMNE at 9.5 years of age, the odds of bedwetting at 14 years of age ($n=5899$) were 3.5 and 23 respectively.⁶ Similar findings from Hong Kong demonstrated a strong association between childhood elimination dysfunction and adolescents and adults with NE,⁷ *i.e.*, there is no guarantee that a child will grow out of their enuresis, and the presence of LUTS in childhood is a strong predictor for NE in adolescence and adulthood.

Children's perception of their bedwetting is variable; some studies have shown reduced self-esteem when compared with their non-bedwetting peers,^{8,9} while others showed no difference.^{10–13} For younger children, it appears the immediate physical issues, *e.g.* having to wear diapers or waking up to a feeling of wetness, are the main perceived annoyance. For adolescents, both resolved and ongoing bedwetting has psychosocial consequences; in the ALSPAC cohort ($n=5887$), self-reported consequences for previous enuresis that resolved between 4 and 9 years of age included poorer self-image, more problems with peer relationships in school, and a more negative perception of school at 14 years of age. Not surprisingly, those 14-year

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olds who were still bedwetting had higher self-reported levels of poor self-image, peer victimization, and depression in girls.¹⁴

Parents have variable responses to NE in their offspring, which can include tolerance but also anger, frustration, and punishment,^{15,16} particularly in older children and among less educated parents. Punishment rates vary from 2% to 89% across cultures, however, it is counterproductive and is associated with more severe childhood enuresis and depression scores, as well as reduced health-related quality of life scores.¹⁷ Other studies demonstrate that quality of life scores are reduced both for the mothers and their children, irrespective of parental attitude.¹⁸ Certainly, enuresis can affect the whole family, and punishment may not come only from the parents but may include siblings and extended family members. It is always worth clearly explaining that enuresis is not the child's fault and advocating for the enuretic child whilst appreciating the burden that may be placed on the parents and family.

With regards to management, initial treatment involves behavioral adaptations and parents commonly restrict fluid ingestion and wake their children to take them to the toilet, although these practices have been found to be minimally effective in one meta-analysis¹⁹ and detrimental in another.²⁰ When parents approach healthcare professionals for advice, the first recommended steps involve additional behavioral change, such as regular drinking, toileting, etc. Subsequent first-line specific treatments involve use of the enuresis alarm with complex behavioral adaptations and/or desmopressin, requiring rigorous fluid restriction and timed use before sleep.^{21,22} For motivated, compliant children with tolerant, supportive parents, this is achievable, often successful and rewarding for all concerned. However, healthcare professionals are well advised to be aware of the important message contained in Mota et al.'s article,³ which is in agreement with other series from around the world: there is a strong association between comorbid psychological disorders and NE with rates being two to four times higher than in non-enuretics.²³ In addition, older age, boys, and NMNE and secondary NE are even more strongly associated with comorbid psychological disorders. Although internalizing disorders (such as anxiety) are associated, NE is more strongly associated with externalizing behavior disorders and attention deficit hyperactivity disorder (ADHD) in particular. In the Pelotas cohort,³ the proportion of enuretics with NMNE was higher than that reported in other cohorts^{2,3} (this may be because their definition includes "intestinal disorders" which is not routinely included in the ICCS definition) but their associations are similar. What does this mean? The exact relationship between behavioral disorders and childhood incontinence is not entirely clear and possibilities include that the disruption of nocturnal incontinence gives rise to psychological behaviors, the psychological disorder in combination with a genetic predisposition gives rise to incontinence, that they are both part and parcel of the same neurobiological dysfunction, or that they coexist coincidentally. Either way, the presence of comorbid behavioral disorders will affect NE treatment choices and outcomes; the healthcare professional is advised to actively enquire, observe, and screen children for these difficulties and refer

to an appropriate service if indicated.²³ Otherwise, we risk adding to the child's difficulties and the parents' burden.

Conflicts of interest

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References

1. Austin PF, Bauer SB, Bower W, Chase J, Franco I, Hoebeke P, et al. The standardization of terminology of lower urinary tract function in children and adolescents: update report from the Standardization Committee of the International Children's Continence Society. *Neurourol Urodyn.* 2016;35: 81–471.
2. Wright AJ. The epidemiology of childhood incontinence in paediatric incontinence: evaluation and clinical management. In: Franco I, Austin PF, Bauer SB, von Gontard A, Homsy Y, editors. *Pediatric incontinence: evaluation and clinical management.* Hoboken, NJ: John Wiley & Sons Ltd.; 2015. p. 7–183.
3. Mota DM, Matijasevich A, Santos IS, Petresco S, Mota LM. Psychiatric disorders in children with enuresis at 6 and 11 years old in a birth cohort. *J Pediatr (Rio J).* 2020;96:318–26.
4. Croudace TJ, Jarvelin MR, Wadsworth ME, Jones PB. Development typology of trajectories to nighttime bladder control: epidemiologic application of longitudinal latent class analysis. *Am J Epidemiol.* 2003;157:42–834.
5. Joinson C, Heron J, Butler R, Croudace T. Development of nighttime bladder control from 4 to 9 years: association with dimensions of parent rated child maturational level, child temperament and maternal psychopathology. *Longitud Life Course Stud.* 2000;1:73–94.
6. Heron J, Grzeda MT, von Gontard A, Wright A, Joinson C. Trajectories of urinary incontinence in childhood and bladder and bowel symptoms in adolescence: prospective cohort study. *BMJ Open.* 2017;7:e014238.
7. Bower WF, Sit FK, Yeung CK. Nocturnal enuresis in adolescents and adults is associated with childhood elimination symptoms. *J Urol.* 2006;176:5–1771.
8. Hagglof B, Andren O, Bergstrom E, Marklund L, Wendelius M. Self-esteem in children with nocturnal enuresis and urinary incontinence: improvement of self-esteem after treatment. *Eur Urol.* 1998;33:9–516.
9. Theunis M, Van Hoecke E, Paesbrugge S, Hoebeke P, Vande Walle J. Self-image and performance in children with nocturnal enuresis. *Eur Urol.* 2002;41:7–660.
10. 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;32:16–605.
11. Robinson JC, Butler RJ, Holland P, Doherty-Williams D. Self-construing in children with primary mono-symptomatic nocturnal enuresis: an investigation of three measures. *Scand J Urol Nephrol.* 2003;37:8–124.
12. Van Hoecke E, Hoebeke P, Braet C, Walle JV. An assessment of internalizing problems in children with enuresis. *J Urol.* 2004;171:3–2580.
13. Wagner WG, Geffken G. Enuretic children: how they view their wetting behavior. *Child Study J.* 1986;16:8–13.

14. Grzeda MT, Heron J, von Gontard A, Joinson C. Effects of urinary incontinence on psychosocial outcomes in adolescence. *Eur Child Adolesc Psychiatry*. 2017;26:58–649.
15. Sapi MC, Vasconcelos JS, Silva FG, Damião R, Silva EA. Assessment of domestic violence against children and adolescents with enuresis. *J Pediatr (Rio J)*. 2009;85:7–433.
16. Sá CA, Gusmão Paiva AC, de Menezes MC, de Oliveira LF, Gomes CA, de Figueiredo AA, et al. Increased risk of physical punishment among enuretic history with family history of enuresis. *J Urol*. 2016;195:30–1227.
17. Al-Zaben FN, Sehlo MG. Punishment for bedwetting is associated with child depression and reduced quality of life. *Child Abuse Negl*. 2015;43:9–22.
18. Kilicoglu AG, Mutlu C, Bahali MK, Adaletli H, Gunes H, Duman HM, et al. Impact of enuresis nocturna on health-related quality of life in children and their mothers. *J Pediatr Urol*. 2014;10:6–1261.
19. Caldwell PH, Nankivell G, Sureshkumar P. Simple behavioural interventions for nocturnal enuresis in children. *Cochrane Database Syst Rev*. 2013. CD003637.
20. Grzeda MT, Heron J, Tilling K, Wright A, Joinson C. Examining the effectiveness of parental strategies to prevent bedwetting: an observational cohort study. *BMJ Open*. 2017;7:e016749.
21. Neveus T, Eggert P, Evans J, Macedo A, Rittig S, Tekgül S, et al. Evaluation of and treatment for monosymptomatic nocturnal enuresis. *J Urol*. 2010;183:7–441.
22. Franco I, von Gontard A, De Gennaro M. Evaluation and treatment of nonmonosymptomatic nocturnal enuresis: a standardization document from the International Children's Continence Society. *J Pediatr Urol*. 2012;9:43–234.
23. von Gontard A, Baeyens D, Van Hoecke E, Warzak WJ, Bachmann C. Psychological and psychiatric issues in urinary and fecal incontinence. *J Urol*. 2011;185:7–1432.