

# Primary monosymptomatic nocturnal enuresis and associated factors in a referral continence clinic of Abu Dhabi

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## Abstract

The aim of the present study was to investigate the prevalence of primary monosymptomatic nocturnal enuresis (PMNE) and its associated factors in a major referral centre for nocturnal enuresis in the City of Abu Dhabi. Children referred to the Pediatric Continence Clinic of Department of Pediatric and Urology Surgery at Al Noor Hospital, Abu Dhabi (UAE), between January 2014 and January 2016 for the suspected diagnosis of NE were considered. The inclusion criteria of our study were: age 5-14 years; full medical history and physical examination; urine dipstick to exclude glycosuria and proteinuria; completion of diagnostic urological work-up; final diagnosis of PMNE. Parents were encouraged to follow a program on urotherapy. All children underwent renal and bladder ultrasound, abdominal X-ray and uroflowmetry with electromyography. Constipation was treated, if present. 39 patients had a diagnosis of PMNE. A constipation was present in 17 children (43.6%). Statistical analysis documented a higher incidence of PMNE in the male groups. 38 out of 39 children (97.4%) resolved PMNE, 14 following urotherapy and 24 required medical therapy with desmopressin. Our experience clearly confirms a higher prevalence rate of PMNE in boys than in

girls. In the study population, the large intake of dry and reduced-fibers foods, the excessive intake of carbonated drinks and the hot climatic condition might negatively influence the incidence of fecal retention and the subsequent PMNE. A multi-modal assessment seems to be effective in the management of PMNE, showing a very high rate of resolution.

## Introduction

Acquisition of urinary control is a complex process in which the final stages are usually achieved at the age of 3 to 4 years when the majority of children develop an adult pattern of urinary control.<sup>1</sup> According to Diagnostic and Statistical Manual and Mental Disorders (DSM) 5, nocturnal enuresis (NE) is defined as repeated voiding of urine into bed or cloche while asleep in children older than 5 years.<sup>2</sup> Even if NE is considered a very common pediatric disorder, the estimated prevalence is highly variable from country to country.

According to its onset, ICCS classified NE as primary or secondary, where the term of primary NE (PNE) includes NE children that have never achieved urinary continence for a period of at least 6 consecutive months, whereas in secondary type NE, the disorders appears after the child has established a period of at least six consecutive months of urinary control.<sup>3</sup> Moreover, NE is divided in monosymptomatic nocturnal enuresis (MNE) and non-monosymptomatic nocturnal enuresis (NMNE), the latter associated with any other lower urinary tract symptoms and with a history of bladder dysfunction, in accordance with updated ICCS terminology.<sup>4</sup> In this respect, it has been reported that 30-35% of enuretic children have a non-monosymptomatic form.<sup>5</sup>

NE can be responsible for behavioural, psychological and social problems including embarrassment, blushing, lack of self-esteem and aggression.<sup>6</sup> Therefore, identifying children at risk and performing measures are necessary.<sup>6</sup> Considering the importance and comorbidities as well as complications associated with NE and at the light of a lack of a comprehensive studies in this regards in the City of Abu Dhabi (UAE), our study aimed to investigate the prevalence of primary monosymptomatic nocturnal enuresis (PMNE) and its associated factors in the paediatric population, in a major referral centre for Nocturnal Enuresis, under the care of a single Consultant.

## Materials and Methods

Children referred to the Pediatric Continence Clinic of Department of Pediatric and Urology Surgery at Al Noor Hospital –

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City of Abu Dhabi (UAE), between January 2014 and January 2016 for the suspected diagnosis of NE were considered. The inclusion criteria of our study were: age 5-14 years; full medical history and physical examination; urine dipstick to exclude glycosuria and proteinuria; completion of diagnostic urological work-up; final diagnosis of PMNE; follow-up of at least 6 months from the resolution of symptoms at the time of the visit to the outpatient clinic. Parents or children were invited to complete a frequency-volume chart to measure fluid intake and voided volume, for at least 2 days as well as episodes of NE, DTUI, other lower urinary tract symptoms (LUTS) and bowel movements, for at least 1 week. The parents were explained the normal bladder function and the pathogenesis of NE<sup>3</sup> and were encouraged to follow a program on urotherapy based on international standards. Children were instructed to void regularly every two and 1/2 hours during the day and always at bedtime.<sup>3</sup> Correct toilet posture was optimized to allow relaxation of the pelvic floor muscles and a drawing of correct toilet sitting posture was given to each patient. Water and other caffeine-free drinks ad libitum were allowed during the day. Patients were also encouraged to eat fibre-rich food and recommended to maintain daily defecation of soft stools, with the help of the Bristol Stool Chart. All children underwent renal and bladder ultrasound to rule-out urogenital anomalies, abdominal X-ray to assess fecal load and/or spina bidifa occulta (PBO) and uroflowmetry with electromyography (EMG) of the pelvic floor muscles and post-void residual US scan (PVR). Exclusion criteria were neuropathic bladder, anatomical abnormality affecting the bladder or the bowel, urethral and meatal stenosis, children primarily referred for UTIs, children with neurological and psychiatric problems, patients with primary non-monosymptomatic nocturnal enuresis, patients that did not complete the diagnostic protocol, patients with follow-up shorter than six months from the beginning of the therapy. Patients with constipation were treated with PEG 3350, at paediatric doses for oral faecal disimpaction, they were treated with desmopressin 120 or 240 mpg one time a day at bed-time. Patients not responding to desmopressin were treated with anticholinergics (Tolterodine or Propiverine). Combinations were utilized as indicated in resistant cases to first line therapy.

## Results

One-hundred twenty eight patients were referred at our Institution for the suspected diagnosis of NE, 82 males (64%) and 46 females (36%). In 35 males (mean age 8.8±2.1 years) and 4 females (mean age 10.7±2.2 years) a PMNE was diagnosed (30.5%). A constipation was present in 17 children (43.6%), 15 males and 2 females. A SBO was diagnosed in 2 patients (5.1%) a male and a female. None had a story of UTI. Statistical analysis documented a significant higher incidence of PMNE in the male

**Table 1. Effective management in males and females affected by primary monosymptomatic nocturnal enuresis.**

PMNE	Males	Females
Urotherapy + desmopressin	11	2
Urotherapy + desmopressin + PEG	10	1
Urotherapy	8	0
Urotherapy + PEG	5	1
Total	34	4

PMNE, primary monosymptomatic nocturnal enuresis; PEG, polyethylene glycol.

groups as compared with the female one ( $P=0.0002$ ). 38 out of 39 children (97.4%), 34 out of 35 males and all female, resolved PMNE. In particular, 14 out of 39 (35.9%) following urotherapy and treating constipation with PEG, if present while 24 required medical therapy with desmopressin. Resolution management is summarized in Table 1.

## Discussion

Because the line is blurring between MNE and NMNE, our diagnostic assessment of children affected by PNE is based on a first clinical appraisal followed by bladder ultrasound, abdominal X-ray and uroflowmetry with electromyography (EMG). Our data confirms the findings that PMNE is prevalent among boys than girls<sup>7-10</sup> while PMNE represents about 10% of PNE in female pediatric Abu Dhabi population.

We were surprised that more than 40% of children with PNME has a stool retention, without any significant difference in the sex. It is reported that rectal distension due to fecal retention might cause bladder distortion and uninhibited bladder contraction which may lead to urinary tract symptoms, including nocturnal enuresis.<sup>11</sup> However, our impression is that incidence of constipation in our study population is significantly higher, being previously reported at 7% in MNE affected patients.<sup>12</sup>

Actually, we do not know the real influence of constipation in the pathogenesis of PMNE, but we believe that in the study population the large intake of dry and reduced in fibers foods such as rice and lemon, the excessive intake of carbonated drinks and the hot climatic condition might negatively influence the incidence of fecal retention and the subsequent PMNE. In our experience, urotherapy and bowel management resolved PMNE in more than one third of cases and the association with desmopressin was definitive in 97%. We believe that the high rate of resolution of PMNE in our study is related to the pre-assessment investigations (urinalyses, uroflow with EMG, RBUS, abdominal X-Ray) in order to exclude unreported and undiagnosed symptoms and abnormalities. In this regard, even if diagnostic tools, excluding the clinical appraisal followed by a urine dipstick test, are not warrant as first line in the assessment of PMNE,<sup>3</sup> we believe that this strategies carries a greater chance of success. Moreover, because NE affect child's self image, the relation with peers and parents and schooling,<sup>13,14</sup> we suggest a more in-depth evaluation of the problem, to reduce the incidence of failure and to accelerate the resolution.

## Conclusions

In conclusion, it appears that associated factors in Abu Dhabi population are different from those in the studies conducted in other countries. Our experience clearly confirms a higher prevalence rate of PMNE in boys than in girls. A multi-modal assessment seems to be effective in the management of PMNE, showing a very high rate of resolution.

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