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To cite this article: Hassan A. Abdelwahab, Enayat M. Soltan, Mokhtar A. Metawee, Mahmoud H. Sherief & Adel H. Metwally (2015) Nocturnal enuresis in women and its relation to urinary incontinence, Arab Journal of Urology, 13:3, 199-202, DOI: [10.1016/j.aju.2015.03.001](https://doi.org/10.1016/j.aju.2015.03.001)

To link to this article: <https://doi.org/10.1016/j.aju.2015.03.001>



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Published online: 05 Apr 2019.



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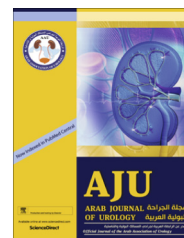


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Arab Journal of Urology
(Official Journal of the Arab Association of Urology)

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VOIDING DYSFUNCTION/FEMALE UROLOGY
ORIGINAL ARTICLE

Nocturnal enuresis in women and its relation to urinary incontinence



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Received 29 November 2014, Received in revised form 11 March 2015, Accepted 29 March 2015
Available online 8 May 2015

KEYWORDS

Nocturnal enuresis;
Adult-onset;
Female urinary incontinence

ABBREVIATIONS

NE, nocturnal enuresis;
UI, urinary incontinence;
QoL, quality of life;
OAB, overactive bladder;
BMI, body mass index;
ICIQ-SF, International Consultation on

Abstract Objective: To assess the prevalence of nocturnal enuresis (NE) in Egyptian women, its relation to urinary incontinence (UI), and the impact on their quality of life (QoL).

Subjects and methods: This was a cross-sectional study involving 350 women, using multistage sampling to recruit them. The inclusion criterion was women aged ≥ 18 years who lived in the Ismailia governorate. Four trained nurses interviewed the women at their houses in two areas selected randomly, one rural and one urban. The Arabic validated International Consultation on Incontinence Questionnaire-Short Form was used to assess the symptoms of UI, frequency and severity of urinary leakage, impact on QoL, and the presence of NE. The results were analysed statistically using appropriate methods.

Results: The mean age of the women was 42.46 years. The prevalence of adult-onset NE was 12/350 (3.4%), and this increased significantly with increasing age and history of previous surgery (e.g., hysterectomy) ($P < 0.05$). There was a statistically significant association between NE and UI, as 11 of 12 women with NE had UI; most (seven of the 12) had mixed UI. The mean QoL score of NE, UI alone and normal subjects was 6.8, 4.7 and 0.02, respectively ($P < 0.05$).

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Peer review under responsibility of Arab Association of Urology.



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Conclusions: The overall prevalence of adult-onset NE was 3.4% amongst Egyptian women. The presence of NE correlated positively with UI, and UI had a negative impact on the QoL of women, but NE had a greater impact.

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Introduction

The International Children's Continence Society defines nocturnal enuresis (NE) as an intermittent incontinence of urine or bedwetting whilst sleeping, regardless of the presence or absence of concomitant daytime voiding symptoms [1].

The overall prevalence of NE was 20–25% in children aged 4 years and 10% in children aged 7 years, and this prevalence decreased with increasing age [2–6]. An over-active bladder (OAB) adversely influences the quality of life (QoL) amongst both younger and older people. A family history of urinary incontinence (UI) and childhood NE were identified as risk factors for OAB [7].

Adult-onset NE can be associated with various medical problems or underlying urological diseases, but there has been little research on the prevalence of and risk factors for adult NE [8]. The aim of the present study was to assess the prevalence of NE in Egyptian women, the relation between NE and UI, and its impact on QoL.

Subjects and methods

This was a cross-sectional study that included 350 women, recruited by multistage sampling. The inclusion criterion was women aged ≥ 18 years and living in the Ismailia governorate. Four trained nurses interviewed the women at their houses in two areas selected randomly, one rural and one urban. Demographic data were collected, i.e., age, residence, parity, educational level, smoking habit, chronic diseases, and previous surgery.

The Arabic validated International Consultation on Incontinence Questionnaire–Short Form (ICIQ-SF) was used to assess the symptoms of UI, frequency and severity of urinary leakage, impact on QoL and the presence of NE. The nurses also measured the weight and height of the women to calculate their body mass index (BMI). There were no further physical examinations or investigations.

The results were analysed statistically, using descriptive data analysis to present the prevalence of NE, and the arithmetic mean for age, BMI and the QoL score. The chi-squared test and Fisher's exact test were used to compare the categorical data amongst the groups. Anova was used to assess the impact of NE on QoL compared with UI alone and in normal subjects. In all

tests, $P < 0.05$ was considered to indicate statistical significance. All subjects were free to be involved or to withdraw whenever they wanted. The confidentiality was preserved for all data and test results of all the study participants.

Results

In all, 350 women were interviewed (mean age 42.46 years). Most of the women (85, 24.2%) were aged 30–39 years. The mean parity was 2.95 and the mean BMI was 30.8 kg/m². The prevalence of NE was 12 of 350 (3.4%), and the prevalence increased significantly with increasing age and history of previous surgery (e.g., hysterectomy) ($P < 0.05$). There was no statistically significant difference with residence, marital status, parity, menopause, smoking, obesity, and chronic diseases such as diabetes mellitus (Table 1).

There was a statistically significant association between NE and UI, as 11 of 12 women with NE also had UI; seven had mixed UI ($P < 0.05$), two had pure stress UI, two had urge UI, and one had no UI.

The mean (SD) ICIQ-SF score in those with NE and no NE was 12.17 (4.3) and 3.27 (5.2), respectively, the difference being statistically significant ($P < 0.001$; Student's *t*-test). The mean (SD) QoL score in the NE group, in those with UI alone or in normal subjects was 6.8 (3.04), 4.7 (3.40) and 0.02 (0.15), respectively ($P < 0.001$; one-way anova).

Discussion

NE is a common problem amongst children, but the magnitude of this problem in adults has been addressed by only a few reports. Several factors, such as increased urine production, a low bladder capacity or OAB, were thought to be the pathophysiological mechanisms of paediatric NE [9].

In the present study the overall prevalence of adult-onset NE in women was 3.4%. NE with no associated LUTS was reported by 0.28%, whilst the remainder (3.12%) had NE associated with UI. Buckley et al. [10] reported that bedwetting occurred in 4% of women. Yeung et al. [11] reported the prevalence of adult NE in females aged 16–40 years as 2%. Baek et al. [8] assessed women with a similar age range of 16–40 years and found a prevalence of NE of 3%. Helstrom et al. [12] found that 0.6% of studied females aged 17 years had NE.

Table 1 The demographic data of the 350 women, the relation between NE and UI, and the effect of NE on the ICIQ-SF score.

Variable	NE (12)	No NE (338)	Total	<i>P</i>
Age category (years)				< 0.001 ^a
18–29	0	74	74	
30–39	0	85	85	
40–49	1	69	70	
50–59	5	70	75	
60–69	4	32	36	
≥ 70	2	8	10	
Residence				0.55 ^a
Urban	6	140	146	
Rural	6	198	204	
Marital status				0.47 ^a
Married	9	286	295	
Divorced	0	4	4	
Widow	3	38	41	
Single	0	10	10	
Parity				0.53 ^a
0	0	9	9	
1	0	42	42	
2	2	58	60	
≥ 3	10	229	239	
Menstruation				0.24 ^a
Premenopausal	5	198	203	
Postmenopausal	7	140	140	
Smoking				0.58 ^a
Yes	0	8	8	
No	12	330	342	
Grade of obesity				0.127 ^a
Normal	1	59	60	
Overweight	2	126	128	
Obese	9	153	162	
Previous surgery				0.019 ^a
Hysterectomy	2	8	10	
Cystocele repair	1	10	11	
Anti-UI	0	3	3	
None	9	317	326	
Diabetes mellitus				0.62 ^a
Yes	4	91	95	
No	8	247	255	
UI	11	125	136	< 0.001 ^a
No UI	1	213	214	
Mixed UI	7	47	54	< 0.001 ^b
No mixed UI	5	291	296	

^a Chi-squared test.^b Fisher's exact test.

In contrast to the study of Buckley et al. [10] and Baek et al. [8], who stated that NE was not age-related, the present study showed that NE increased significantly with increasing age, and that 11 of 12 women with NE were aged ≥ 50 years. This discrepancy might be due to the difference in the age range amongst the studies. Also, our study was designed to focus on the prevalence of NE in women.

In the present study there was no statistical difference between women with NE and women with no NE in residence, marital status, parity, menopause, smoking, obesity, and other diseases. However, there was a statistically significant difference between these two groups in age, previous history of pelvic surgery (e.g., hysterectomy) and UI. Baek et al. [8] reported that the prevalence rates of NE remained relatively stable amongst different age groups. Gender, marital status and education were not risk factors for developing NE, whilst a history of urological disease, present urological disease, and combined urinary frequency increased the probability of NE, but with no statistical significance. A family history, urgency or urge UI significantly increased the probability of NE episodes. They also reported that there was no relationship between the duration of sleeping and the prevalence of NE, even though the prevalence of NE was higher when the duration of sleeping was 8–10 h ($P = 0.047$).

The present study showed that NE was strongly related to UI, either its presence or the frequency and volume of urine leakage, as there was a positive correlation between NE and the mean ICIQ-SF score. Most of these women had mixed UI, with a statistically significant difference, then pure stress UI and urge UI.

Sakamoto and Blaivas [13] reported that when they excluded patients with daytime UI from their study of 3277 consecutive patients, including males and females, none of the women reported adult-onset NE.

Yeung et al. [14] concluded that urodynamic studies of patients with NE showed that > 90% had underlying detrusor overactivity and three-quarters had some form of functional bladder outlet obstruction. These results were supported by Yucel et al. [15], who reported that primary NE persisting into adulthood might be associated with abnormal urodynamic findings, as they found that 41.6% of studied females had detrusor instability and/or hypocompliance, despite 90% having no daytime urological symptoms.

Many studies reported that adult enuretics had urinary symptoms and an abnormal bladder function, including a small bladder capacity, detrusor overactivity during sleep and detrusor hypercontractility secondary to bladder outlet obstruction [16–23]. These findings support the positive relation between NE and UI.

In the present study the impact of NE on QoL was statistically significant compared with UI alone or normal subjects. UI compromised the QoL but NE had a worse effect. Yeung et al. [11] stated that those with NE had a significantly higher incidence of depression and a lower self-esteem, and a higher incidence of sleep disturbances, than the control group. They also noted that in 32–40% of those with NE it had some effect on their choice of job, and work performance and social activities. In agreement with this, Baek et al. [8] reported that the self-esteem score was lower ($P = 0.053$) and the

depression-scale score was higher ($P = 0.003$) in those with NE than in non-enuretic persons.

A limitation of the present study was the inability to assess nocturnal polyuria amongst the women who participated.

In conclusion, the prevalence of adult-onset NE was 3.4% in this sample of Egyptian women. NE correlated positively with the presence of UI, especially mixed UI. UI had a negative impact on the QoL of women, but NE had a worse impact.

Conflict of interest

None.

Source of funding

None.

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