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ARE TODAY'S NOCTURIA PATIENTS THE FORMER BEDWETTERS? AN INTERNET-BASED NATIONAL EPIDEMIOLOGICAL SURVEY

Hypothesis / aims of study

Nocturia is the complaint that the individual has to wake up at night one or more times to void and has been reported to affect 10-20% of men and 25-30% of women aged 18-40 years. Enuresis is defined as intermittent urinary incontinence while sleeping and persists in adulthood in approximately 3%. The aim of this study was to determine the relationship between nocturia in adulthood and enuresis during childhood.

Study design, materials and methods

The survey was performed in Germany in subjects ≥ 18 years in 2010. Text providing background information to improve awareness for these urinary symptoms and to increase motivation to complete questionnaires was posted on several internet pages. The questionnaire included 30 questions covering bladder habits (micturition; fluid intake), lower urinary tract symptoms (frequency; urgency; voided volumes), information concerning family history or concomitant diseases, and quality of life (sleep quality; daytime exhaustion). The study population was divided into three groups: (1) people with present nocturia or (2) enuresis and (3) controls. The control group consisted of subjects not having either nocturia or enuresis. Statistical analyses included comparison of the subgroups (χ^2-test) and logistic regression to profile enuresis against nocturia as well as both diseases against the control.

Results

Questionnaires answered by 1,201 subjects were evaluated and grouped into nocturia (53.4%), enuresis (18.1%), and control groups (28.5%). The statistical analysis demonstrated significant differences between the subgroups as demonstrated in table 1. A direct comparison of subjects with nocturia and those with enuresis was carried out with a logistic regression model provided in table 2.

In comparison with the control group, it was demonstrated that enuresis in childhood is a strong indicator for enuresis in adulthood ($p<0.0001$; odds ratio 9.841) as well as a weaker indicator for current nocturia ($p=0.0747$; odds ratio 1.351)

Table 1: Comparison of people with nocturia or enuresis with the control group.

Parameter	Nocturia [N=641]	Enuresis [N=217]	Control [N=343]	χ^2 test (p value)
Gender (proportion of men)	56.0%	91.2%	51.6%	<0.0001
Age, years (median)	42	38	35	<0.0001*
Family history of enuresis				
• in parents	12.0%	20.3%	10.5%	0.0019
• in children	36.0%	21.2%	47.1%	<0.0001
• in siblings	17.7%	25.0%	13.6%	0.0030
Urgency in childhood (answered by 62.3% of subjects)	32.4%	64.1%	23.0%	<0.0001
Enuresis when starting school (answered by 89.5% of subjects)	31.5%	74.2%	23.9%	<0.0001
Current symptoms of LUTS				
• urgency	58.8%	76.5%	36.4%	<0.0001
• in general small voided volumes	21.7%	19.4%	12.2%	<0.0001
• urinary frequency > 8 times/day	14.8%	28.6%	9.6%	<0.0001
Restriction of fluid intake to restrict urination frequency	17.5%	24.4%	9.2%	<0.0001
Poor sleep quality	59.6%	47.9%	40.5%	<0.0001
Frequent or constant daytime exhaustion or increased disturbances of memory	66.6%	60.4%	59.8%	0.0589
AMONG THESE PEOPLE: Relation of the symptoms with nocturia	36.0%	39.7%	4.9%	<0.0001

[*: Kruskal-Wallis test]

Table 2: Logistic regression analysis of enuresis vs. nocturia after backward elimination on the level $\alpha=0.05$. Data are shown as odds ratio of enuresis for having nocturia.

Variable	p value	Odds Ratio	95% Confidence Interval	
			CI_{lower}	CI_{upper}
Intercept	<0.0001	0.037		
Gender (male vs female)	0.0070	0.607	0.422	0.872
Age (≤median vs >median; median = 39 years)	<0.0001	7.485	4.439	12.622
Urinary frequency (>8 vs. ≤8 times daily)	0.0010	2.091	1.349	3.240
Urgency in childhood (yes/unknown/no)	0.0072	1.722	1.159	2.561
Enuresis when starting school	<0.0001	3.930	2.639	5.913

Interpretation of results

With the information provided in the family history, it is likely that parents of children with enuresis (47.1%) responded to the questionnaire. This puts into perspective some of their answers which would otherwise have been surprising, e.g. the large number of enuresis when starting school (23.9%) what also implies that the control group was not truly representative and, therefore, different to control groups usually found in epidemiological studies. Therefore incidences cannot be taken as absolute values but as relative characteristics for comparing subgroups. Compared with those in the control group, a high proportion of subjects with enuresis had suffered from urgency and enuresis in childhood. People with nocturia had a high percentage of urgency in childhood compared to controls. However, the multivariate analysis did not provide statistical power to these findings. A relationship between enuresis in childhood and current nocturia or enuresis was demonstrated. Children with enuresis have a considerably greater risk of suffering from nocturia or persistent enuresis in adulthood. Surprisingly high is the number of adults in the total study population suffering from enuresis. Typical is the reported restriction of fluid intake in the evening, which is a well-known coping strategy that is also adopted but to a lesser extent by people with nocturia. Data on quality of life impairment in are not surprising although the figures for the control group have to be put into perspective, given the fact that almost half of them have bedwetting children.

Concluding message

The data suggest that bedwetting in childhood is a strong indicator of persisting enuresis in adulthood. It is possible that the number of unreported cases of adult enuresis is higher than previously reported. The study confirmed the relationship between nocturia and childhood enuresis. The shift in symptoms from enuresis to nocturia with persistence of the underlying condition is likely to be demonstrated. These results call for the prompt and targeted treatment of enuresis, which might not only reduce the rate of adults with this condition but also the number of people with nocturia. This could result in an overall improvement in quality of life of those affected, from childhood onwards.

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Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**No**
This study did not require ethics committee approval because	**this is a webbased epidemiological study.**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**No**