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OBESITY IS ASSOCIATED WITH INCONTINENCE AND NOCTURIA BUT NOT WITH OTHER URINARY STORAGE SYMPTOMS

Hypothesis / aims of study

Earlier research on relation of obesity with urinary storage symptoms has focused mainly on incontinence in women. We evaluated the association of overweight/obesity with urinary storage symptoms among both sexes aged 18-79 years.

Study design, materials and methods

In 2003-2004, questionnaires were mailed to 3,000 men and 3,000 women randomly selected from the Finnish Population Register Centre. Pregnancy, puerperium (<6 weeks after delivery), and urinary tract infection were regarded as exclusion criteria. Age-standardization was performed using the general population of Finland (as of Dec 31st, 2003) [1].

Self-reported current body weight and height were used to calculate body mass index (BMI, body weight in kilograms divided by the square of height in meters). Subjects were classified based on BMI as normal-weight (BMI <25 kg/m², referent), overweight (BMI 25-30 kg/m²) and obese (≥30 kg/m²). Subjects with BMI <25 kg/m² included 5 men and 53 women who were underweight (BMI <18.5 kg/m²). There was no difference in the prevalence of any symptom among underweight subjects compared with normal-weight.

Information on voiding symptoms was collected using the DAN-PSS [2], with additional frequency question and nocturia question from AUA-SI [3]. Urgency, urgency incontinence and stress urinary incontinence were defined as abnormal if reported often or always (in scale never-seldom-often-always, applied for the past 2 weeks). Frequency was defined as >8 voids/day and nocturia as >1 void/night.

Importance of confounding factors was assessed: age, physician-diagnosed comorbidity (40 conditions), prescribed medication (30 groups according to ATC-DDD), socio-demographics (marital status, education, employment, and urbanity), smoking (never, former, current), use of coffee (cup/day) and alcohol (grams/day), parity, postpartum period (6 weeks-12 months after delivery) and menopausal status (including hormone therapy and hysterectomy).

Separately for both sexes and each symptom, logistic regression was used for analyses, with the presence of symptom as the outcome. First, we calculated odds ratios (OR) for each symptom with adjustment for age (Bivariate). Secondly, multivariate analyses with confounding factors were performed (Multivariate).

Separately for both sexes and each symptom, all factors associated (p < 0.10) with symptom in the age-adjusted analysis were entered as potential confounding factors into a multivariate model. Finally, backward techniques were used to build the final model with likelihood ratio tests used to determine significance. At least 10% change in the estimate of any reproductive factor due to reduction of potential confounding factor was regarded as confounding.

Results

Of the 6,000 subjects, 3,729 (62.4%) participated and 114 were excluded due to pregnancy, puerperium or urinary tract infection. Of the included, 1,576 men and 1,711 women answered to all symptom and anthropometric questions. Among them, 14% (95% confidence interval (CI): 12-16%) of both sexes were regarded as obese, whereas 46% (43-50%) of men and 32% (29-35%) of women as overweight (age-standardized).

Symptoms fulfilling the criteria of urgency, urgency incontinence, frequency, nocturia and stress urinary incontinence was reported by 116, 14, 87, 175 and 7 men and 148, 38, 163, 169 and 159 women, respectively. Age-standardized prevalence of these symptoms were reported by 8.0%, 0.9%, 6.0%, 12.2% and 0.4% of men and 9.7%, 3.0%, 9.5%, 12.5% and 10.6% of women, respectively.

Urgency and frequency were not related with obesity in either sex. However, without adjustment for all confounding factors, obese women reported more urgency than normal-weight. Both urgency incontinence and stress incontinence were strongly associated with obesity among women, whereas number of men with these symptoms was too small for reliable analyses. Furthermore, obesity was associated with increased nocturia among both sexes. (**Table**)

Overweight women reported more nocturia and stress incontinence than normal-weight but only association with nocturia remained significant after adjustment for confounding factors. Among men, overweight was not associated with any storage symptom. (**Table**)

Table. Association of overweight and obesity with urinary storage symptoms

Men				Women			
Bod	y mass index*			Body mass index			
25-30 kg/m ²		≥30 kg/m²		25-30 kg/m ²		≥30 kg/m²	
OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI

Urgency								
Bivariate†	0.9	0.6-1.4	1.3	0.7-2.2	1.0	0.6-1.4	1.6	1.0-2.5
Multivariate‡	0.9	0.6-1.5	1.1	0.6-2.0	1.3	0.6-1.4	1.3	0.8-2.1
UUI								
Bivariate	Not porf	ormed (small nu	mhor of cas	,oc)	2.0	0.9-4.5	4.8	2.1-11
Multivariate	Not pend	Jillieu (Sillali Ilu	ilibei oi cas	oes)	1.5	0.6-3.6	2.9	1.2-7.2
Frequency								
Bivariate	8.0	0.5-1.2	0.9	0.5-1.8	1.1	0.7-1.5	1.0	0.6-1.6
Multivariate	8.0	0.5-1.4	0.9	0.4-1.7	1.0	0.7-1.5	0.8	0.5-1.4
Nocturia								
Bivariate	1.2	0.8-1.8	2.3	1.4-3.9	2.0	1.3-2.9	3.2	2.0-4.9
Multivariate	1.2	0.8-1.9	2.1	1.2-3.5	1.9	1.2-2.8	2.3	1.4-3.7
SUI								
Bivariate	Not non	formed (amall n	imbor of on	000)	1.4	1.0-2.1	2.6	1.7-4.0
Multivariate	not per	formed (small nu	unibei oi ca	5 6 5)	1.3	0.9-2.0	2.0	1.3-3.2
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^{*} Normal-weight subjects were regarded as referent.

Interpretation of results

Obesity was associated with increased nocturia in both sexes and incontinence in women. Validity of these results was strengthened by high response rate, representative study population, and adjustment for major confounding factors.

Concluding message

Obesity is associated with increased nocturia in both sexes and increased incontinence in women but is not associated with urinary urgency or frequency in either sex.

References

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[†] Adjusted for age.

[‡] Adjusted for all confounding factors (partly different factors for different symptoms/sexes).