

Somatic Comorbidity in Women with Overactive Bladder Syndrome



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Purpose: We explore the influence of co-occurring somatic illnesses on prevalent overactive bladder in women of premenopausal age.

Materials and Methods: Data for the present study were derived from a nationwide survey on complex diseases among all twins in the Swedish Twin Registry born 1959 to 1985. The present study was limited to female twins participating in the survey (12,850). Generalized estimating equations were used to estimate odds ratios with 95% CIs. Environmental and genetic influences were assessed in co-twin control analysis.

Results: Generalized estimating equations analysis showed a significant association between overactive bladder and migraine (OR 1.34, 95% CI 1.15–1.57), fibromyalgia (1.83, 1.54–2.18), chronic fatigue (1.81, 1.49–2.19) and eating disorders (1.56, 1.24–1.96). There was also a significant association with allergic disorders including asthma (1.24, 1.01–1.52) and eczema (1.22, 1.04–1.43). Among reproductive disorders, urinary tract infections (1.60, 1.40–1.84), dysmenorrhea (1.53, 1.33–1.76) and pelvic pain (1.60, 1.31–1.94) showed the strongest association with overactive bladder. Results from co-twin control analysis indicated that the significant associations observed in generalized estimating equations analysis were influenced by environmental and genetic factors without a common pathway model.

Conclusions: Our results suggest a multifactorial and complex pathogenesis of overactive bladder in which associations between various somatic illnesses and overactive bladder may be affected by environmental and genetic factors.

Key Words: comorbidity; urinary bladder, overactive; psychosomatic medicine

Abbreviations and Acronyms

BMI = body mass index
BPS = bladder pain syndrome
GEE = generalized estimating equations
IC = interstitial cystitis
OAB = overactive bladder

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OVERACTIVE bladder is a symptom syndrome that affects approximately 12% of the community dwelling population and is defined as “urinary urgency, with or without urgency incontinence, usually with frequency and nocturia” by the International Continence Society.¹ Our current understanding of the

co-occurrence of overactive bladder and somatic illnesses is largely fragmentary. With the exception of diabetes,² and neurologic diseases such as multiple sclerosis, Parkinson disease and dementia,^{3–5} the effects of co-occurring somatic disorders in women with overactive bladder are poorly

understood. Previous epidemiological studies suggest that various somatic diseases influence the occurrence of overactive bladder but have been limited by insufficient control for environmental and genetic confounding.^{6–8} Increasing knowledge of how overactive bladder relates to other somatic conditions may provide important clues to the pathophysiological mechanisms involved in overactive bladder. In this study we assessed whether somatic illnesses are associated with overactive bladder using data from a large nationwide Swedish Twin Registry screening on common complex diseases and exposures among female twins of premenopausal age.

METHODS

Data Sources

This study was approved by the regional research ethics board at Karolinska Institutet and conforms to the STROBE (STrengthening the Reporting of OBservational studies in Epidemiology) guidelines (www.strobe-statement.org). The Swedish Twin Registry, established in the 1950s, contains data on nearly all twins born in Sweden since 1886.⁹ Methods for assigning zygosity have been validated with DNA as having 98% or higher accuracy.⁹ Data for the present study were derived from a comprehensive survey on common complex diseases and common exposures among all twins in the Swedish Twin Registry born 1959 to 1985 (42,852) in 2005 (described in detail previously).^{10,11} The overall response rate to the survey, the STAGE (Screening Twin Adults: Genes and Environment) study, was 66% among women (12,850). The present study was limited to female twins participating in the survey since there were insufficient numbers of males with overactive bladder to allow for valid analyses.

Data Ascertainment

The entire questionnaire contained approximately 1,300 questions divided into 34 sections using a branching format, meaning that participants were asked followup questions only if they responded positively to key initial questions. Overactive bladder was defined according to the International Continence Society criteria as a positive response to the question, “Do you experience sudden urgency to void with little or no warning?” Ascertainment of prevalent somatic diseases was performed using structured questions based on the criterion that disease had been confirmed by a physician, and included rheumatic diseases (rheumatism, systemic lupus erythematosus, ankylosing spondylitis), diabetes mellitus, inflammatory bowel diseases (Crohn disease and ulcerative colitis), functional somatic disorders (migraine, fibromyalgia, chronic fatigue), eating disorders (anorexia, bulimia), allergies (hay fever and eczema), asthma, myocardial infarction, infectious diseases (urinary tract infection and sexually transmitted diseases), reproductive disorders (dysmenorrhea, pelvic pain not including bladder pain, endometriosis) and endocrine diseases (hypothyroidism and other glandular disorders). Information on relevant

covariates including the use of snuff, smoking habits, BMI, childbirths, educational level (classified as elementary school, high school and college/university) and age was derived from the survey.

Statistics

To evaluate the association between OAB and somatic diseases, logistic regression was used based on generalized estimating equations, which take into account the correlated (twin) structure of the data. The GEE analysis was adjusted for age and childbirth, and ORs were estimated with 95% CIs. Women who responded positively on the question about current bladder pain were excluded from all analyses to avoid including cases of BPS/IC (155).

Monozygotic twins share an identical genotype whereas dizygotic twins on average share 50% of their segregating genes. The co-twin control analysis is used to control for genetic background and unmeasured early environment shared by twins when studying the relationship between a putative exposure and a disease in disease discordant twin pairs. If estimates from co-twin control analysis, compared to GEE estimates, are attenuated, then the associations are confounded by familial factors. If the attenuation is present for monozygotic and dizygotic twins, the associations are confounded by shared environmental factors. A reduction of the associations only among monozygotic twins suggests that the associations are confounded by genetic factors. A $p < 0.05$ was considered significant for all analyses and all statistical analyses were performed using SAS® software (version 9.2).

RESULTS

Table 1 presents the characteristics of participants in the survey in relation to prevalent overactive bladder. Background characteristics including mean age (33.4 years [SD 7.6] without OAB and 34.1 [SD 7.8] with OAB), educational level, BMI, pregnancy, snuff use and smoking were similar between the groups.

Table 1. Characteristics of study participants

	No./Total No. without OAB (%)	No./Total No. with OAB (%)
Birth yr:		
1959–1964	2,707/11,637 (23.3)	271/1,033 (26.2)
1965–1969	2,288/11,637 (19.7)	210/1,033 (20.3)
1970–1974	2,190/11,637 (18.8)	184/1,033 (17.8)
1975–1979	2,064/11,637 (17.7)	181/1,033 (17.5)
1980–1985	2,388/11,637 (20.5)	187/1,033 (18.1)
Educational level:		
Elementary school	512/11,511 (4.4)	50/1,020 (4.9)
High school	5,631/11,511 (48.9)	482/1,020 (47.3)
College/university	5,368/11,511 (46.6)	488/1,020 (47.8)
Obesity (BMI greater than 30 kg/m ²)	589/11,341 (5.2)	83/1,022 (8.5)
Pregnancy	7,029/10,970 (64.0)	618/925 (66.8)
Snuff users	311/8,979 (3.5)	22/762 (2.9)
Smokers	655/8,980 (7.3)	46/761 (6.0)

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