

ARE DEPRESSION AND ANXIETY IN WOMEN ASSOCIATED WITH URINARY INCONTINENCE AND ITS SUBTYPES?

Hypothesis / aims of study

To determine if urinary incontinence (UI) in women is associated with depression and anxiety, and to determine whether this association differs by UI severity or subtype.

Study design, materials and methods

We used data from the General Longitudinal Overactive Bladder Evaluation (GLOBE), a prospective population based survey study conducted from 2006-2008. A random sample of about 8,000 primary care female patients from a U.S. integrated Health System over the age of 40 were recruited for a Bladder Health Survey, a validated questionnaire using a four-week recall period covering severity and occurrence of UI and its subtypes. Test retest reliability values of the individual and composite scores of each domain are shown in table 1. A composite score of 2+ (range 0-6) was considered to be a case of UI. Women with UI were then classified into stress, urge, or mixed UI. Stress UI was defined as a composite score of 2+ on the two stress UI questions *and* a score of 0 or 1 on the urge UI questions. Conversely, urge UI was defined as a composite score of 2+ on the two urge UI questions *and* a score of 0 or 1 on the stress UI questions. Mixed UI was defined as: (a) a score of 1 for stress UI *and* 1 for urge UI; or (b) a score of 2+ for stress UI *and* 2+ for urge UI. Subtypes were considered mutually exclusive. Severity of UI was calculated by multiplying frequency with volume of urine loss using the Sandvick severity index. For this analysis, we used data from all female patients who responded to the baseline questionnaire in 2006. Data on depression and anxiety were pulled from the electronic medical records of all corresponding patients using ICD9 diagnoses from encounters before 2006 (when the survey was administered) and from 2006 to 2008. Prevalence of depression and anxiety was measured by UI status, subtype and severity using ANOVA, Chi-square and Kruskal Wallis tests. Logistic regression was used to control for confounders including age, marital status, education, parity, BMI, smoking status. Because of the strong correlation between depression and anxiety, further adjustment was made for anxiety when depression was analyzed and vice versa.

Results

Of the total 3,599 female respondents, 1,229 (34.7%) were classified as having UI with a mean age of 59 (+/-13). The prevalence of stress, urge and mixed UI was 28.2%, 25.6%, 46.1%, respectively. One third of women had a normal BMI (<25kg/m²), with the rest being overweight or obese. About 90% had a high school education or more.

Question Domain	Q #	Question	Test-retest reliability Spearman's r	
			Item	Composite Score
		<i>How often in past 4 weeks¹</i>		
Urinary Incontinence	1	Lose any urine, even a small amount?	0.83	0.85
	2	Lose more than a few drops or small amount of urine?	0.73	
		<i>How often did you lose urine because you²</i>		
Stress Incontinence	3	Were coughing hard, laughing, or sneezing?	0.74	0.77
	4	Were lifting, pushing, or pulling a heavy object?	0.71	
Urge Incontinence	5	Had trouble getting to the bathroom in time?	0.72	0.79
	6	Had a sudden urge to urinate?	0.73	
1. Never / rarely (0), A few times (1), About once a week (2), A few times a week (2), Every day (3)				
2. Never / rarely (0), Less than half the time (1), Half the time or more (2), Always (3)				

Two thirds were married, 16% widowed, and 18% either divorced or never married. Compared to no UI (mean age = 59), women with stress UI (mean age = 55) were younger, but those with mixed UI (mean age = 60) and urge UI (mean age = 63) older ($P < 0.001$). More women with mixed or stress UI were overweight or obese (77%) when compared with women with urge UI (70%) or no UI (61%) ($P < 0.001$). The median (interquartile range) UI severity score was highest among women with mixed UI followed by urge and stress UI: 4 (2-6) vs 3 (2-4.5) vs 2 (1-3), respectively ($P < 0.001$).

Table 2 depicts prevalence of depression and anxiety by UI status and subtype, and further broken down by diagnosis of depression and anxiety in the medical records after 2006 (when the survey was conducted). Overall prevalence of depression and anxiety was higher in women with UI (12.8% and 22.4%, respectively) vs no UI (9.8% and 19.5%, respectively). The highest prevalence by subtype was in stress followed by mixed and urge UI. There were similar trends in women whose diagnosis of depression and anxiety was made after 2006.

	N	Depression	Anxiety	Depression after 2006	Anxiety after 2006
No UI	2315	9.8%	19.5%	6.1%	14.8%
UI (any type)	1229	12.8%	22.4%	9.0%	17.1%

Mixed UI	567	12.5%	22.2%	8.3%	16.9%
Stress UI	347	14.7%	24.5%	10.1%	17.3%
Urge UI	315	11.1%	20.3%	8.9%	17.1%

Table 3 shows the adjusted and unadjusted OR for the various models by UI status, subtype and severity. In general, UI is associated with depression (but not anxiety) even after adjustment of covariates. By subtype, only stress UI is associated with depression, but this association loses its significance when we further adjust for anxiety. Finally, UI severity is associated with depression but not anxiety.

	Depression	Anxiety
UI (overall) vs no UI		
- unadjusted	1.35 (1.09-1.67)	1.19 (1.00-1.41)
- adjusted for baseline covariates	1.30 (1.05-1.63)	1.11 (0.94-1.32)
- further adjusted for anxiety or depression	1.28 (1.03-1.61)	1.08 (0.90-1.28)
UI subtypes ¹ : Stress UI vs no UI		
- unadjusted	1.59 (1.14-2.20)	1.34 (1.03-1.74)
- adjusted for baseline covariates	1.43 (1.03-2.00)	1.30 (0.99-1.70)
- further adjusted for anxiety or depression	1.36 (0.97-1.91)	1.23 (0.94-1.62)
UI severity		
- unadjusted	1.05 (0.99-1.11)	1.04 (0.99-1.09)
- adjusted for baseline covariates	1.07 (1.01-1.14) 1.06	1.04 (0.99-1.10) 1.03
- further adjusted for anxiety or depression	(1.00-1.13)	(0.98-1.08)
1. Data on mixed (or urge UI) vs no UI were not significant in any of the models (not shown)		

Interpretation of results

The odds of depression among women with UI is significantly higher compared to those without UI both before and after adjustment (including adjusting for anxiety). However, the odds of anxiety is not significantly higher for those with UI compared to those without UI after adjustments. Of the three UI subtypes, stress UI appears to be most strongly associated with depression; however, after adjustment for anxiety, stress UI is no longer a risk factor for depression. As UI severity increases, the prevalence of depression also increases.

Concluding message

Women with UI have a higher prevalence of depression which varies by UI subtype. Worsening UI is also associated with a higher prevalence of depression. Finally, there appears to be no significant association between UI and anxiety.

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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?	Yes
Specify Name of Ethics Committee	Institutional Board Review for health Reaserch, Geisinger Medical Center
Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	No