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Stewart W[1], Hirsch A[1], Blaivas J[2], Newman D[3], Payne C[4], Fitzgeral M[5], Burgio K[6], Cundiff G[7], Dilley A[8], Minassian V[1]

1. Geisinger Health System, 2. Weill Medical College at Cornell University, 3. University of Pennsylvania Medical Center, 4. Stanford University School of Medicine, 5. Loyola University Health System, 6. University of Alabama at Birmingham School of Medicine, 7. Providence Health Care, 8. GlaxoSmithKline

VARIATION IN INCONTINENCE AND OVERACTIVE BLADDER (OAB) SYMPTOMS IN A POPULATION BASED LONGITUDINAL STUDY

Hypothesis / aims of study

Longitudinal studies report remission and new onset rates of incontinence, urinary urgency, and other symptoms that are relatively high and seemingly inconsistent with prevalence estimates.[1-2] It is possible that some portion of cases thought to be in remission actually transitioned from an "active" symptom period to a "silent" or "inactive" symptom period. We used data from the General Longitudinal Overactive Bladder Evaluation (GLOBE), a population based study, to describe variation in reported incontinence and OAB symptoms at two points in time, six months apart, and to estimate the transition rate from active to inactive symptom states.

Study design, materials and methods

A random sample of 15,656 primary care patients (i.e., from an integrated U.S. Health System) 40+ years of age was selected and mailed the Bladder Health Survey; 44% responded. Individuals were selected without knowledge of their health history or history of bladder control problems. A sub-sample received the same questionnaire six months later, and 74% (n = 2748) responded. The Bladder Health Survey uses a four-week recall period and covers severity and occurrence of urgency (4 questions), nocturia (2 questions), frequency (3 questions), and incontinence (2 questions). Occurrence in the past four weeks was reported as never/rarely, a few times, about once a week, a few times a week, or every day. In addition, questions were asked about adaptive behaviors (6 questions; e.g., defensive voiding), type of incontinence (5 questions), time since onset of symptoms, and possible causes of symptoms. Composite scores were derived for urgency, nocturia, frequency, incontinence, bother, and adaptive behaviors as indicators of severity and occurrence. A previous reliability study indicated that test-retest Spearman's correlations coefficients for these scores were excellent, ranging from 0.82 to 0.86. Change in reported symptom scores for incontinence and urgency between the two surveys were modeled as categorical and continuous measures using logistic and linear regression. Covariates in the model included age, BMI, time since onset of symptoms, UTIs, history of bladder problems, pelvic surgeries, doctor diagnosed BPH, number of births, hysterectomy, and self reported pattern of symptoms (i.e., comes and goes, getting worse, getting better, happens all the time). For the logistic model, an active state of urgency symptoms was defined as a score of 4+ (13-point scale) indicating symptoms occurring at least a few times in the past four weeks. Active incontinence was defined as a score of 2+ (7 points scale) indicating that urine loss episodes occurred at least a few times in the last 4 weeks. Change in status between baseline and the six-month follow-up was defined as a continuous variable (i.e., how much change relative to variation in the baseline measure) and as a categorical measure (i.e., percent who changed status from active to inactive symptoms and the percent who changed from inactive to active symptoms). Sensitivity analyses were completed to determine how results varied by the cut-point criteria used.

Results

For the follow-up survey, we found no differences between respondents and non-respondents in sex or reported baseline symptoms for bladder control; non-respondents were younger. The study population comprised 1537 women and 1182 men; 58% were 40-64. Change in symptoms status was common for both females and males (Table 1), but the variation differed by sex. The overall change in urgency scores was high, accounting for 37% of the variation in the baseline score (i.e., baseline variation + change variation) for females and 43% of the score for males. A similar pattern was observed for incontinence. Categorical measures of change indicate that males had higher rates of transition from active to inactive status (**A⇒I**) than females for urgency and incontinence and females had higher rates of transition from inactive to active status (I⇒A).

In logistic regression analysis (Table 2), statistically significant adjusted odds ratios between covariates and urinary urgency and incontinence transition rates were observed for age (females only), duration of time since onset, and self reported patterns of symptoms. The most significant odds ratios were observed for patient self-reported experience. Patients who checked responses indicating that their symptoms "happened all the time" or "were getting worse," had a high odds ratio of persistent symptoms (i.e., symptoms scores at or above threshold on both surveys) for urinary urgency and for incontinence. In contrast, those indicating that symptoms were getting better had an odds ratio less than 1.0 of persistent symptoms.

Table 1. Estimates of variation in urinary urgency and incontinence symptoms between baseline and follow-up by sex

Sex	Composite Measure	Baseline			Change			Change in Status		
		Mean	IQR[1]	Var	Mean	IQR[1]	Var	% Var[2]	A⇒I[3]	I⇒A[4]
Female	Urgency (n=1526)	5.6	5.0	11.4	-0.34	3.0	6.7	37%	20%	19%
	Incontinence (n=1499)	2.2	4.0	4.0	-0.07	2.0	2.0	33%	30%	14%

Male	Urgency (n=1173)	5.0	4.0	8.4	-0.49	3.0	6.3	43%	32%	14%
	Incontinence (n=1169)	1.3	2.0	2.7	-0.13	1.0	1.79	40%	41%	10%

1 – IQR refers to inter-quartile range, the middle 50% of the distribution
2 – Variance(change score)/(Variance(baseline score) + Variance(change score)) X 100
3 – Percent of those above the symptom score threshold at baseline who fell below the score at follow-up
4 - Percent of those below the symptom score threshold at baseline who were at or above the score at follow-up

Table 2. Adjusted odds ratios for the associations with having active symptoms at baseline and follow-up for urgency and incontinence

Covariate	Female		Male	
	Urinary Urgency Adjusted OR n=1009	Incontinence Adjusted OR n=850	Urinary Urgency Adjusted OR n=742	Incontinence Adjusted OR n=389
Age	1.008	1.024^2	1.015	1.017
Duration – 6 to 12 mo. [3]	2.6^2	1.7	1.9^2	0.9
Duration – 1 to 2 yrs. [3]	2.4^2	1.2	1.5	1.5
Duration – 3 to 5 yrs. [3]	2.7^2	1.9	2.6^2	1.2
Duration – 5 or more yrs. [3]	3.0^2	2.3^2	9.5^2	1.5
Happens all the time	2.8^2	11.6^2	4.1^2	5.4^2
Getting better	0.9	0.7	0.8	0.5
Getting worse	4.1^2	5.7^2	6.0^2	13.4^2

1 – For urinary urgency, active = score of 4+ . For incontinence active = score of 2+
2 – Statistically significant (p<0.05)
3 – Reference group: "Less than 6 months"

Interpretation of results
These results indicate that individuals with urinary urgency or incontinence vary substantially in their symptom experience over time and that variation in experience corresponds to self described patterns. Variation declines in relation to duration of time since onset, possibly indicating that loss of variation is an indicator of progression. The findings from this study are consistent with what has been observed for other common symptomatic conditions like depression, pain disorders, and asthma.

Concluding message
These findings highlight the need to understand the distinction between remission of symptoms and being in an inactive symptom state.

References
1. British Medical Journal (2000) 320; 1429-1432.
2. World J Urology (2003) 20; 327-336.