

INCIDENCE OF AND RISK FACTORS FOR CHANGES IN URINARY INCONTINENCE STATUS IN A PROSPECTIVE COHORT OF MIDDLE-AGED AND OLDER WOMEN

Hypothesis / aims of study

Urinary incontinence (UI) is a dynamic condition that can both progress and regress over time. We followed a population representative cohort of over 1400 women over 5 years to determine the rates of new UI, progression of existing UI, or resolution or regression of UI and to ascertain risk factors for changes in incontinence status.

Study design, materials and methods

The Reproductive Risks for Incontinence Study at Kaiser 2 (RRISK2) is a prospective cohort study of women members of Kaiser Permanente Medical Care Program of Northern California, a pre-paid group practice with over 3 million members, about 25% of general population in the area served. The study was approved by the institutional review (human subjects) boards of both the University of California, San Francisco and Kaiser Division of research. A random sample of women between 40 and 69 years of age as of January 1, 1999 who have been members since age 18 was generated from membership files. Women were screened and recruited with the goal of obtaining weighted sample with equal numbers in each 5 year age strata and a distribution of 40% white, 20% Hispanic, 20% Asian and 20% African-American participants. Women were excluded if they did not speak English or Spanish, reported having had less than half of their births within Kaiser, were no longer members of Kaiser, had moved out of the area, or were demented or otherwise too impaired to participate. Eligibility could not be determined for 1326 women. Of 2817 women determined to be eligible, 2109 (74.9%) were enrolled. A second survey was conducted approximately 5 years later which was completed by 1413 (67%) of the original cohort. Data were collected by pre-interview and in-person questionnaires and by review of medical records, including labor and delivery records which were available from 1945. Questionnaires ascertained variables including age, self-reported race/ethnicity, a detailed description of current UI symptoms, past history of UI, medical and surgical history, pregnancy and parturition history, menopausal status, hormone replacement, health habits, general health, and demographics. Weight and height were measured by the interviewer and used to calculate body mass index (BMI) in kg/m². Current UI was defined as at least monthly incontinence for the past 12 months and was further characterized as less than weekly, weekly and daily. Women who reported no UI in the past 12 months were defined as continent. Type of incontinence was defined for those women with at least weekly incontinence, according to their response to two questions, one asking if UI occurred "with an activity like coughing, lifting, sneezing or exercise" (stress incontinence) and the other asking if UI occurred "with a physical sense of urgency" (urge incontinence). Women were classified as having stress incontinence if they reported the majority of episodes being stress UI, and as having urge incontinence if they reported the majority of the episodes being urge UI. Those reporting both stress and urge UI with neither predominating were classified as mixed UI. Women with only other incontinence (n=34) were excluded from the analyses by incontinence type. Change in UI status was defined as incident UI (change from continence to any degree of incontinence); resolution of UI (change from any degree of incontinence to continence); progression of UI (change from < weekly UI to weekly or daily UI, or from weekly UI to daily UI); regression of UI (change from weekly UI to < weekly or from daily UI to weekly or < weekly UI). The univariate associations between candidate risk factors and change in UI status were assessed using logistic or proportional odds models. Variables associated with change in UI status at $p \leq 0.2$ in models adjusting were evaluated for inclusion in a multiple logistic regression model. Variables whose inclusion resulted in a meaningful ($\geq 10\%$) change in the estimated association between any racial/ethnic group and incontinence were retained in the model. Continuous variables were also assessed as categorical variables to maximize the opportunity for detecting confounding. Association was expressed as odds ratio (OR) and 95% confidence intervals (95% CI). All p-values were two-sided. All analyses were carried out in SAS Version 8.02 (SAS Institute, Cary, NC).

Results

Table 1 below shows the transitions in UI status from baseline to 5-year follow-up. Among the 386 women who were continent at baseline, 31% reported incontinence at follow-up, though this was mostly limited to mild incontinence (< weekly), with just 4% reporting weekly or daily UI. Progression of UI was found in 18% of women with UI less than weekly at baseline, and 26% of women with weekly UI at baseline. Resolution of UI was seen in 18% of women with UI less than weekly, but less than 4% (14/290) of women with weekly or daily UI. While the proportion of women reporting any incontinence in the past 12 months remained essentially unchanged from baseline to 5 years (72.0% vs. 72.6%), the proportion reporting daily UI increased slightly from 11.7% to 13.3%.

Table. Change in incontinence status from first to second visit (approximately 5 years). % refers to row percent (baseline continence status).

Continen ce Status at First Visit (n)	at	Continen ce Status at Second Visit									
		Continent		Incontinent		< Weekly		Weekly		Daily	
		%	(n)	%	(n)	%	(n)	%	(n)	%	(n)
Continent (386)		69	(268)	31	(118)	27	(104)	3	(10)	1	(4)
Incontinent (1,027)		12	(128)	88	(899)	49	(498)	21	(217)	18	(184)
UI less than Weekly (637)		18	(114)	82	(523)	65	(413)	14	(86)	4	(24)
UI weekly (225)		2	(4)	98	(221)	30	(67)	42	(95)	26	(59)
UI daily (165)		6	(10)	94	(155)	11	(18)	22	(36)	61	(101)

In multivariate analyses, parity was strongly predictive of UI regression. For 1 birth, the adjusted OR=2.7, (95% CI=1.2 to 6.2); for 2 births the adjusted OR=3.4, (95% CI=1.7 to 6.6), and for 3 or more births the adjusted OR=3.9 (95% CI=3.6 to 6.9). Smoking was associated with an increased risk of new onset of UI (adjusted OR=1.8; 95% CI=1.01 to 3.2) and a self-reported diagnosis of chronic obstructive pulmonary disease (COPD) was associated with an increased risk of UI progression (adjusted OR=1.7; 95% CI=1.0 to 3.1). Both these findings are consistent with previous studies.

Interpretation of results

Most change in continence status occurs between mild UI and no UI. Movement from continence to UI \geq weekly, or resolution of UI among women with \geq weekly UI is much less common. Among women with weekly UI, over half progress to daily UI or regress to UI < weekly. In contrast, among women with daily UI at baseline over 60% report daily UI and virtually all have at least weekly UI at follow-up. Women in this study who had prior births were more likely to experience UI regression compared to nulliparous women with a modest 'dose-response' effect from 1 birth to 3 or more births. Parity was also associated with a lower risk of new UI or progression of existing UI, though these associations were not significant in multivariate analysis. This finding is of particular interest in light of recent reports that the association of parity with UI grows weaker as women age.[1]

Concluding message

These results suggest that UI \geq weekly is much more stable than UI < weekly. The finding that parity is associated with increased likelihood of regression of UI as women age is intriguing and suggests that the lack of association between parity and UI seen in older women may be due not only to an increase in the effect of aging and other risk factors, but may reflect regression of effects of parity on UI, perhaps mediated by changes in the hormonal milieu. While perhaps counterintuitive given the long-held belief that estrogen protects against UI, it is consistent with cross-sectional and prospective cohort studies showing that the prevalence of stress UI actually decreases around the time of menopause,[2] and with randomized controlled trial data showing that estrogen replacement increases the risk of UI and UI progression.[3]

References

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<i>Specify source of funding or grant</i>	National Institutes Diabetes, Digestive and Kidney Diseases (NIDDK) Grant # DK53335 & the NIDDK/Office of Research on Women's Health Specialized Center of Research Grant # P50 DK064538
<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Committee on Human Research, University of California, San Francisco
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes