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Urinary incontinence and pelvic floor dysfunction in Asian-American women

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Abstract

Objective: The objective of the study was to describe the prevalence, risk factors, and impact of urinary incontinence and other pelvic floor disorders among Asian-American women.

Study design: This was a population-based cohort study of older women randomly selected from age and race strata.

Results: Weekly urinary incontinence was reported by 65 of 345 Asian women (18%), with stress and urge incontinence being approximately equally common. In multivariate analysis, higher body mass index (greater than 25 kg/m²) was associated with both stress incontinence (odds ratio 4.90, 95% confidence interval 1.76 to 13.68) and urge incontinence (odds ratio 2.49, 95% confidence interval 1.01 to 6.16) in Asians. Hysterectomy was a significant risk factor for stress incontinence (odds ratio 2.79, 95% confidence interval 1.03 to 7.54). Only 34% of Asian women with weekly urinary incontinence reported ever having sought treatment. Pelvic floor exercises were the most common form of treatment, being used by 29% of Asian women with weekly incontinence. Asians were less likely than white women to report anal incontinence (21% versus 29%, *P* = .007), although this difference became nonsignificant after adjusting for differences in risk factors.

Conclusion: Asian women share some risk factors for stress and urge urinary incontinence with white women. Urinary incontinence is associated with anal incontinence among Asian women.

Keywords

Urinary incontinence; Anal incontinence; Fecal incontinence; Pelvic organ prolapse; Pelvic floor dysfunction; Asian-American; Asian; Race; Ethnicity

Urinary incontinence is a common problem among older women, with an estimated prevalence of 42% to 57% among women older than 40 years of age in the United States.¹⁻⁵ Despite growing interest in racial and ethnic differences in incontinence, 1 ethnic group that has received very limited attention in incontinence research is Asian-Americans. Recently 2 cross-sectional U.S. studies have suggested that the prevalence of urinary incontinence may be lower in Asian-American women than white women.^{1,2} However, neither study distinguished

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between stress versus urge incontinence or explored differences in risk factors for urinary incontinence between these populations in detail.

Although examination of urinary incontinence in Asian-Americans has been limited, research on anal incontinence and pelvic organ prolapse in this ethnic group is almost absent. This area is of interest because of the association between urinary incontinence, anal incontinence, and pelvic organ prolapse, and the finding that all 3 pelvic floor disorders may share common risk factors in whites.⁶ Without adequate study of these disorders in Asian populations, however, we cannot know whether conclusions about the pathophysiology and quality-of-life impact of pelvic floor dysfunction in white women can also be applied to Asian women.

Previously we described differences in the prevalence and clinical type of urinary incontinence in an ethnically diverse group of older women enrolled in a prepaid health plan.⁷ In this paper we examine differences in the risk factors, impact, and treatment of urinary incontinence among Asian-American versus white women in that cohort. We also describe the prevalence of pelvic organ prolapse and anal incontinence symptoms in Asians versus whites, compare the degree of bother associated with these conditions, and examine the association among all 3 pelvic organ disorders in both racial groups.

Material and methods

The Reproductive Risks of Incontinence Study at Kaiser (RRISK) cohort—We performed a cross-sectional analysis using data from RRISK, a population-based cohort of women enrolled in the Kaiser Permanente Medical Care Program of Northern California, which serves approximately 30% of the population in the Northern California area. To be eligible, women had to be between 40 and 69 years of age on January 1, 1999, to have been continuously enrolled in Kaiser since age 18 years, and to have had at least half of their births within Kaiser. The original RRISK cohort was constructed by sampling women within age and race strata with a goal of obtaining approximately equal number of women in each 5-year age group with a race/ethnicity composition of 20% African-American, 20% Hispanic, 20% Asian-American, and 40% white (non-Hispanic). Additional details on the sampling process used to construct this cohort have been described elsewhere.⁷ The final RRISK group was composed of 2109 women, including the 345 Asians and 1003 whites described in this paper.

Data collection—We obtained informed consent by telephone and in writing at the time of data collection. Demographic characteristics, past medical and surgical history, menopause status, hormone use, incontinence symptoms, and pelvic organ prolapse symptoms were assessed by self-report questionnaires as well as in-person interviews in which written responses were clarified. We asked women to self-identify their race/ethnicity as non-Latina white/Caucasian, Hispanic/Latina, African-American/black, or Asian-American/Asian. Body mass index (BMI) was calculated (kilograms per square meter) based on the participant's weight and height measured at the interview. An experienced medical record analysts abstracted detailed information on labor and delivery as well as surgical events from medical records archived at Kaiser since 1946 for women who initially reported any birth or pelvic or abdominal surgery at Kaiser. This study was approved by the Institutional Review Boards of the University of California, San Francisco and the Kaiser Foundation Research Institute.

Definitions of incontinence and pelvic floor dysfunction—Questions used to elicit information about urinary incontinence were similar to those validated in other large epidemiologic studies and have been reported elsewhere.^{7,8} We asked subjects with at least weekly incontinence to recall the number of episodes in the past 7 days that occurred “with an activity like coughing, lifting, sneezing, or exercise” to distinguish stress incontinence as well as the number of episodes accompanied by “a physical sense of urgency” to distinguish urge

incontinence. Urinary incontinence not associated with either an activity or sense of urgency was characterized as “other urinary incontinence.” We classified subjects as having stress incontinence if they reported only or predominately stress episodes in the past 7 days and as having urge incontinence if they reported only or predominantly urge episodes in the past 7 days.

We asked women reporting weekly urinary incontinence about the impact of symptoms and treatment. Impact was measured using the Incontinence Impact Questionnaire (IIQ), which assesses impact in 4 separate domains (physical activity, emotional health, social/relationships, and travel) as well as overall.⁹ One item from the physical domain (“Has urine leakage affected your physical health?”) was not included to avoid duplication with questions elsewhere on the survey. In computing the physical activity subscale and overall IIQ scores, we imputed the average of the other 5 items in the physical activity subscale for this missing item. Domain subscale scores were transformed to 0 to 100 scales, and the 4 subscales were summed for the total IIQ score (presented on a 0 to 400 scale) as recommended by the authors, with lower scores representing lower impact on daily life.

Pelvic organ prolapse symptoms were defined as a feeling of bulging, pressure, or protrusion from the vagina or as a visible bulging or protrusion from the vagina in the past 12 months. Fecal incontinence was defined as accidental leakage of stool or soiling because of inability to control passage of stool at least once per month in the past 12 months. Flatal incontinence was defined as the unexpected or embarrassing loss of control of gas at least once per week in the past 12 months. Anal incontinence was defined as either monthly fecal incontinence or weekly flatal incontinence.

Statistical analysis—We evaluated potential risk factors for stress incontinence, urge incontinence, and anal incontinence separately for Asians and for whites through stepwise multivariate logistic regression analysis. We included age, parity, and BMI by default in all models given widespread published evidence of their role in the pathophysiology of pelvic floor dysfunction, whereas we included other potential risk factors only if they demonstrated an association at $P \leq .20$ in univariate analysis. For the purposes of analysis, BMI was coded as a dichotomous variable as BMI ≥ 25 kg/m² or greater vs less than 25 kg/m², and parity was also coded as a dichotomous variable as parous vs nulliparous.

To evaluate differences in risk factors between Asians and whites, we also tested all potential risk factors for interactions with race/ethnicity in bivariate logistic regression models. We compared incontinence impact scores for Asian and white women using Wilcoxon rank sum tests because of the nonnormality of the distributions of the overall IIQ score and the 4 domain subscores. In all racial/ethnic comparisons, the larger group, white women, was used as the reference group. All analyses were carried out in SAS (version 8.02, SAS Institute, Cary, NC).

Results

Background characteristics—Characteristics of Asian ($n = 345$) and white ($n = 1003$) participants are summarized in Table I. Overall, Asian women were younger than white women (81% versus 55% under age 60 years, $P! .001$), had higher average household income, were more likely to have completed some college or technical school, and were more likely to be working for pay. Asians were less likely than whites to have certain potential risk factors for incontinence, including parity (mean G SD equal to 1.9 G 1.5 versus 2.1 G 1.5, $P! .01$), higher BMI, frequent urinary tract infections (UTIs) (1 or more UTIs per year), prior hysterectomy, current oral estrogen use, and history of child birth weight 4000 g or more. However, other potential risk factors were more common among Asians, including diabetes, augmented labor, pudendal anesthesia, and third- or fourth-degree vaginal tears.

Risk factors for urinary incontinence—As previous reported,⁷ approximately 70% of Asian women (n = 241) reported urinary incontinence symptoms in the previous 12 months, and approximately 18% (n = 65) reported at least weekly symptoms; with nearly equal numbers reporting stress and urge incontinence (Table II). After adjustment for multiple potential risk factors, the difference in the prevalence of urge incontinence between Asians and whites was substantially decreased and no longer significant (odds ratio [OR] 0.80, 95% confidence interval [CI] 0.48 to 1.31). However, the difference in the prevalence of stress incontinence between Asians and whites was only slightly decreased and remained strongly significant (OR 0.46, 95% CI 0.29 to 0.73, P = .001).

Higher BMI (25 kg/m² or greater) was significantly associated with stress incontinence as well as urge incontinence in Asians (Table III). Higher BMI was also significantly associated with stress and urge incontinence in whites. Hysterectomy was an additional risk factor for stress incontinence among Asians but not whites. Additional risk factors for stress incontinence among whites were frequent UTIs and poor/fair health status; and additional risk factors for urge incontinence among whites were age, current oral estrogen use, and a history of birth weight greater than 4000 g.

Impact and treatment of urinary incontinence—Of the 65 Asian women who reported weekly urinary incontinence, only 1 considered her incontinence to be a severe problem, whereas 11 women (17%) described their incontinence as a moderate problem; and the remaining 52 women (80%) described their incontinence as a mild problem or not a problem at all. Median incontinence impact scores were similarly low for Asians and whites with weekly incontinence (15.5 versus 12.5, P = .38), reflecting that the majority of women in both groups considered their incontinence to be no more than a mild problem. Only the median physical activity impact subscale scores were significantly lower among Asians (P = .03).

Slightly over a third of Asians with weekly urinary incontinence (34%) reported seeing a doctor for this problem, compared with 44% of whites (P = .15). The treatment most commonly reported by both Asian and white women was pelvic floor exercises (29% and 31%, respectively). Seven Asian women also practiced timed urination, 2 had undergone pessary placement, 1 reported using medications for incontinence, and 1 had undergone surgical treatment for incontinence.

Prevalence of other pelvic floor disorders—Just more than 5% of Asians and whites reported bulging, pressure, or protrusion from the vagina (Table IV). Approximately 22% of Asians and 26% of whites had accidental stool leakage in the previous 12 months, but only 4% of Asians and 7% of whites had fecal incontinence on a monthly basis (P = .07 for Asians versus whites). Approximately 20% of Asian women versus 26% of white women (P = .04) reported weekly flatal incontinence. As a result, Asians were less likely to report significant anal incontinence, compared with whites (21% versus 29%, P = .007).

In multivariate analysis, age was a significant risk factor for anal incontinence in both Asian women (OR 1.87, 95% CI 1.26 to 2.79, per 10 years) and white women (OR 1.36, 95% CI 1.14 to 1.61). History of third- or fourth-degree vaginal tear was an additional risk factor for anal incontinence in Asians (OR 2.41, 95% CI 1.14 to 5.10) but not in whites. Additional risk factors for anal incontinence in whites were irritable bowel syndrome (OR 3.21, 95% CI 2.10 to 4.89), frequent constipation (OR 2.09, 95% CI 1.39 to 3.16), and chronic obstructive pulmonary disease (OR 2.08, 95% CI 1.18 to 3.69). After adjustment for factors found to be associated with anal incontinence, the difference in the prevalence of anal incontinence in Asians versus whites was no longer significant.

Of the 18 Asians reporting pelvic organ prolapse symptoms, only 4 women (24%) were moderately or severely bothered by their symptoms. In contrast, 10 of 14 Asian women with fecal incontinence (71.4%) were moderately or severely bothered by their stool leakage. There was no significant difference in the percentage of Asians versus whites who were bothered by their pelvic organ prolapse or fecal incontinence symptoms.

Overlap between pelvic floor disorders—Only 3% of both Asians (n = 10) and whites (n = 34) had both urinary incontinence and pelvic organ prolapse but not anal incontinence symptoms (Table IV). Approximately 11% of Asians (n = 37), compared with 20% of whites (n = 200) (P! .001), had both urinary incontinence and anal incontinence but not pelvic organ prolapse. Less than 2% of both Asians (n = 5) and whites (n = 24) reported symptoms of all 3 pelvic organ disorders. Urinary incontinence was significantly associated with anal incontinence in both Asians (OR 2.22, 95% CI 1.32 to 3.76) and whites (OR 3.38, 95% CI 2.52 to 4.53).

Comment—This study provides new insight into the epidemiology of urinary incontinence and other pelvic floor disorders in an understudied ethnic group in the United States. Higher BMI was associated with a significantly increased risk of both stress incontinence and urge incontinence among the Asian-American women in this cohort. Other characteristics that have been shown to be associated with urinary incontinence in previous research involving mostly white women, such as parity and estrogen use, did not emerge as significant risk factors for Asians in our study. Given that the prevalence of some of these characteristics in our Asian cohort was low, however, additional research involving larger numbers of Asian women may be necessary. To date, none of the few, previous studies of incontinence that have included significant numbers of Asian-American women have addressed risk factors in this ethnic group.^{1,2,10}

Over the past decade, a handful of studies have examined the epidemiology of urinary incontinence in Asian women living outside the United States in Japan,¹¹ Thailand,¹² China,¹³ Taiwan,^{14,15} Singapore,¹⁶ the Philippines,¹⁷ and Hong Kong.^{13,18} The substantial variation in the demographic and medical characteristics of these study populations, as well as lack of consensus about definitions of incontinence and ambiguity about inclusion criteria, make it difficult to draw conclusions from much of these data, although a few of these studies did address risk factors for urinary incontinence. In the cross-sectional study of community-dwelling elderly living in the Kumanoto Prefecture of Japan by Koyama et al¹⁹, for example, no association between parity and urinary incontinence was observed. However, another study of women presenting to the obstetrics and gynecology clinic in Kyushu, Japan, found that higher BMI, parity, and menopause were significant predictors of incontinence.¹¹ A community-based survey of adult women living in Hong Kong found that higher BMI and parity were associated with undifferentiated urinary incontinence,¹³ whereas another survey of communitydwelling Hong Kong women found that higher parity was actually protective against stress incontinence and that only age was predictive of urge incontinence.¹⁸

The prevalence of treatment seeking for urinary incontinence among the Asian women in our study was low, even when symptoms were frequent or disruptive to activities of daily living. Given that all RRISK participants were assigned primary care providers through the Kaiser Permanente system, the low rates of treatment seeking we observed cannot be attributed to basic problems with financial access to care or inability to find a health provider. Previously identified cultural barriers to seeking attention for urinary incontinence have included a lack of knowledge about the condition, a misperception that it is a normal part of aging or childbirth, and a belief that symptoms are inappropriate for medical intervention.²⁰ However, these barriers were identified among groups of predominantly white women, and it is possible that different factors may influence the behavior of women from other ethnic backgrounds.²¹

The current study appears to provide the first published data on pelvic organ prolapse and anal incontinence among Asian-Americans. Comparison with the very few, scattered studies on pelvic floor disorders in Asian women outside the United States is difficult but yield figures consistent with our findings. In 1 study of middleaged, community-dwelling Taiwanese women, for example, the prevalence of fecal incontinence and flatal incontinence was 3% and 9%, respectively.²² Another study of elderly community-dwelling women in Japan found the prevalence of fecal incontinence to be 13%.²³ We found the prevalence of anal incontinence to be lower among Asians than whites, but as in the case of urge urinary incontinence, this was primarily because of differences in the distribution of potential risk factors.

Although this research has multiple strengths, including its use of a large population-based sample and careful measures of incontinence frequency and severity, several limitations should be noted. First, all data on incontinence symptoms and severity were collected by self-report; we did not attempt to get clinical confirmation of our findings. As a result, we cannot exclude the possibility that differences in reporting of pelvic dysfunction symptoms by Asian versus white women contributed to the differences in prevalence we observed. However, we took steps to minimize underreporting in general, such as arranging for in-person interviewers to question women about incontinence and prolapse symptoms after they had completed their written questionnaires, to clarify the questions when needed, and to check answers for consistency.

Additionally, our research did not distinguish between different ethnic subgroups within the Asian race (eg, East Asian, Southeast Asian, Indian subcontinent). Given that these groups may differ with regard to tradition, culture, and genetic admixture, it is possible that the patterns we observed in Asian-Americans overall may not apply equally across various Asian subgroups. Future research about pelvic floor dysfunction in this understudied minority group would benefit from collecting more specific data on country of origin, immigrant generation, and other background characteristics to help explore inter-Asian variations in risk factors, impact, and treatment. Finally, the larger number of significant risk factors for stress and urge incontinence identified among whites, compared with Asians, may reflect the inherently greater power to detect risk factors in the larger group.

In conclusion, Asians share some risk factors for stress and urge urinary incontinence with whites, but it is not clear whether factors such as parity and oral estrogen use convey risk in this population. Asian women are also less likely to have fecal incontinence and anal incontinence than white women, although this difference may be explained by differences in the distribution of risk factors between the 2 groups. We did not find a significant difference in treatment seeking between Asians and whites with moderate to severe urinary incontinence symptoms, but the overall low rates of treatment seeking we observed suggest that failing to seek treatment is an important problem in women of both ethnic groups.

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Table 1
 Characteristics of Asian-American and white participants

Characteristic	Asian (%) (n = 345)	White (%) (n =1003)	P value
Age			
Mean \pm SD	53.2 \pm 7.4	58.0 \pm 9.1	<.001
Education			
High school or less	52 (15.1)	186 (18.6)	.02
Some college	127 (36.8)	426 (42.5)	
College graduate	113 (32.8)	237 (23.6)	
Graduate school	53 (15.4)	153 (15.3)	
Income			
Less than \$40,000/y	51 (14.8)	225 (22.4)	<.001
\$40,000 to \$59,999	47 (13.6)	204 (20.3)	
\$60,000 to \$79,999	63 (18.3)	194 (19.3)	
\$80,000 to \$99,999	55 (15.9)	116 (11.6)	
\$100,000 or more per year	92 (26.7)	187 (18.6)	
Occupation			
Employed for pay	255 (73.9)	573 (57.1)	<.001
Retired, student, homemaker	72 (20.9)	389 (38.8)	
Unemployed/other	18 (5.2)	39 (3.9)	
Parity			
Mean \pm SD	1.9 \pm 1.5	2.1 \pm 1.5	<.01
Nulliparous	71 (20.7)	192 (19.2)	
1	43 (12.5)	88 (8.8)	
2	122 (35.6)	319 (31.9)	
3	77 (22.5)	242 (24.2)	
4+	30 (8.8)	158 (15.8)	
BMI, kg/m ²			
Mean \pm SD	25.8 \pm 4.8	28.0 \pm 6.7	<.001
Less than 25 (underweight-normal)	192 (55.6)	411 (41.0)	
25 to less than 30 (overweight)	90 (26.2)	274 (27.3)	
30 or greater (obese)	63 (18.3)	318 (31.7)	
Medical history			
1 or more UTIs per year	31 (9.0)	131 (13.2)	.03
Diabetes mellitus	38 (11.0)	50 (5.0)	<.001
Chronic obstructive pulmonary disease	13 (3.8)	64 (6.4)	.07
Constipation	32 (9.3)	133 (13.3)	.05
Irritable bowel syndrome	13 (3.8)	125 (12.5)	<.0001
Colorectal surgery	9 (2.6)	43 (4.3)	.16
Current oral estrogen use	75 (21.7)	360 (35.9)	<.001
Current habits			
Smoking	19 (5.5)	86 (8.6)	.07
Alcohol (weekly)	35 (10.1)	376 (37.5)	<.001
Reproductive history			
Hysterectomy	48 (13.9)	224 (22.3)	<.001
Augmented labor	70 (20.3)	124 (12.4)	<.001
Pudendal anesthesia	67 (19.4)	140 (13.4)	.015
Use of forceps	236 (68.4)	646 (64.4)	.18
Episiotomy	215 (62.3)	642 (64.0)	.57
Third- or fourth-degree tears	47 (13.6)	81 (8.1)	.002
Ever birth weight 4000 g or more	29 (8.4)	150 (15.0)	.002

Table II
Clinical patterns of urinary incontinence Among Asian versus white women

	Asians, n (%)	Whites, n (%)	P value
Frequency			
Weekly	38 (10.6)	179 (17.8)	<.01
Daily	27 (7.8)	130 (13.0)	
Type			
Stress	27 (7.8)	155 (15.5)	<.001
Urge	25 (7.3)	95 (9.5)	.04

Table III
Risk factors for stress and urge urinary incontinence (UI) in Asian and White women

Risk factor by UI type	Adjusted OR	95% CI
Risk factors for stress		
UI in Asian women *		
BMI 25 kg/m ² or greater	5.10	1.82-14.31
Hysterectomy	2.79	1.03-7.54
Risk factors for urge		
UI in Asian women †		
BMI 25 kg/m ²	3.35	1.22-9.18
Risk factors for stress		
UI in white women ‡		
BMI 25 kg/m ² or greater	1.84	1.21-2.78
Frequent UTIs	1.80	1.05-3.10
Poor/fair health	2.60	1.43-4.72
Risk factors for urge		
UI in white women §		
BMI 25 kg/m ² or greater	1.71	1.04-2.82
Age (per 10 y)	1.79	1.34-2.40
Oral estrogen use	1.82	1.12-2.93
Birth of infant weighing more than 4000 g	3.06	1.67-5.62

* Adjusted for age, parity, BMI, hysterectomy, and episiotomy.

† Adjusted for age, parity, and oral estrogen use in addition to variables below.

‡ Adjusted for age, BMI, and use of pudendal anesthesia.

§ Adjusted for age, BMI, parity, oral estrogen use, and infant birth weight.

Table IV

Pelvic organ disorders in Asians versus whites

Type of pelvic floor dysfunction	Asians, n (%)	Whites, n (%)	P value
Urinary incontinence *	65 (18.4)	309 (30.8)	< .001
Pelvic organ prolapse †	18 (5.2)	58 (5.8)	.69
Fecal incontinence ‡	14 (4.1)	68 (6.8)	.07
Flatal incontinence §	67 (19.4)	256 (25.5)	.04
Anal incontinence ¶	73 (21.2)	287 (28.6)	.007
Urinary incontinence + pelvic organ prolapse	10 (2.9)	34 (3.4)	.66
Urinary incontinence + anal incontinence	37 (10.7)	200 (19.9)	<.001
Anal incontinence + pelvic organ prolapse	5 (1.5)	24 (2.4)	.30
Urinary incontinence + pelvic organ prolapse + anal incontinence	5 (1.5)	15 (1.5)	.95

* Defined as involuntary urine leakage at least weekly for at least 3 months in a row during the past 12 months.

† Defined as a feeling of bulging, pressure, or protrusion, or visible bulging or protrusion from the vagina within the past 12 months.

‡ Defined as accidental leakage of stool or soiling because of inability to control passage of stool at least monthly for the past 12 months.

§ Defined as unexpected or embarrassing loss of control of gas at least weekly for the past 12 months.

¶ Defined as at least monthly fecal incontinence or weekly flatal incontinence.