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Urinary incontinence in community-dwelling older Mexican American and European American women

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Abstract

The aim was to measure prevalence and correlates of urinary incontinence in community-dwelling Mexican American (MA) and European American (EA) women from a cross-sectional analysis of baseline data from a longitudinal cohort. Participants were MA and EA women, aged 65 years and older, in the San Antonio Longitudinal Study of Aging (SALSA), of whom 421 (97.4%) responded to the question “How often do you have difficulty holding your urine until you can get to a toilet.” Measurements included sociodemographic, functional, cognitive, psychosocial, and clinical status variables derived from bilingual interviews and performance-based tests. Urinary incontinence prevalence was 36.6% (n=154). MA women reported less incontinence than did EAs (29% versus 45%, $p=0.001$). In multivariable analyses in MA women, urinary incontinence correlated with the presence of fecal incontinence (OR 4.0, 95% CI 1.1 – 14.0) and more dependency in Activities of Daily Living (1.4, 1.1–1.8) after controlling for significant sociodemographic factors. In EA women, only age >75 (4.2, 1.4–12.4) was associated with urinary incontinence. MA women were less likely to report incontinence compared to EAs, despite MAs having increased number of children, less education, higher BMI, and more diabetes. Further research is needed to evaluate risk factors for urinary incontinence among MA women.

Keywords

urinary incontinence; fecal incontinence; epidemiology of urinary incontinence; risk factors

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1. Introduction

Urinary incontinence, a common health problem among older adults in the community, has an estimated prevalence of 2.5 to 50% (Hunnskaar et al., 2003; Nygaard, et al., 2004). However, recent epidemiological evidence provides new insight on prevalence among different racial/ethnic groups. In the NHANES from 1999–2000, 38% of adult women reported urinary incontinence when asked about “difficulty controlling your bladder” (Anger et al., 2006). Prevalence of incontinence was higher among EA (41%) and MA (36%) than among non-Hispanic blacks (20%). The report of daily incontinence increased with age from 12.2% in women 60–64 years old to 20.9% in women 85 years and older (Anger et al., 2006). In a recent population based cohort study of 2,109 middle-aged and older, ethnically diverse women, age adjusted prevalence of weekly incontinence was highest among Hispanic women (36%), followed by white (30%), black (25%), and Asian-American women (19%, Thom et al., 2006).

Many proposed risk factors for urinary incontinence have been evaluated. Compared to younger women, older women may have different factors that contribute to urinary incontinence. These factors include: functional and cognitive impairment, presence of other lower urinary tract symptoms, prior hysterectomy, and co-morbid disease burden (Hunnskaar et al., 2000). Other suggested risk factors include number of vaginal deliveries, post-menopausal status, higher body mass index (BMI), white race, educational status, and depression (Thom and Brown, 1998; Nygaard et al., 2003; Holroyd-Leduc and Straus, 2004). In postmenopausal women, the risk of urge incontinence was increased 50% with co-existence of diabetes (Brown et al., 1999).

Much less is known about risk factors that contribute to urinary incontinence in specific ethnic minority groups, particularly Hispanic women. Although other studies have included Hispanic women, many have small numbers of participants and do not report data on the ethnic composition of the Hispanic women, such as self-reported country of origin (Brown et al., 1999; Sampsel et al., 2002; Espino et al., 2003; Thom et al., 2006). A cross-sectional population-based study of older Hispanic women from the southwest United States reported a prevalence of 15% for any type of urinary incontinence and identified advanced age and higher BMI as potential risk factors (Espino et al., 2003). No known studies compare risk factors among older Hispanic women in comparison to White women to determine why differences exist in urinary incontinence prevalence rates and risk factors. Other studies comparing older African American and whites found a higher prevalence of urinary incontinence among white participants, with African American women having less stress incontinence (Burgio et al., 1991; Brown et al., 1999; Fultz et al., 1999; Sampsel et al., 2002; Jackson et al. 2004). Hispanic women have also been found to have higher rates of stress incontinence and pelvic organ prolapse than whites (Hendrix et al., 2002; Swift et al., 2005; Thom et al., 2006).

Given the paucity of information about racial/ethnic differences in prevalence and risk factors for urinary incontinence in older ethnic minority groups, we examined self-reported urinary incontinence and its correlates in a population-based cohort of community-dwelling MA and EA older women.

2. Methods

2.1. Sample

The sample consisted of women in the SALSA, a community-based study of the disablement process in older (65+ years) MA and EA men and women. SALSA subjects were recruited from the earlier San Antonio Heart Study (SAHS), a population-based study of diabetes and

cardiovascular disease among MAs and EAs (1979–1982 and 1984–1988). Detailed descriptions of the SAHS and SALSA sample and methods have been published previously (Espino et al., 2001). Briefly, participants in the SAHS were randomly sampled from three types of neighborhoods: low-income, predominantly MA neighborhoods (barrio); middle-income, ethnically balanced MA and EA neighborhoods (transitional); and high-income, predominantly EA neighborhoods (suburbs). All SAHS participants who were 65+ years of age in 1992–1996 were eligible to participate in SALSA. In SALSA, data were obtained by bilingual staff using a comprehensive two-part survey: a home-based assessment conducted in participants' homes and a clinical performance-based assessment conducted in the university's Clinical Research Center. Of the 1247 eligible SAHS participants, 166 (13.7%) had died prior to the start of SALSA and another 18 (1.4%) died before completion of testing. Of the 1,063 SAHS survivors, 749 (70.5%) men and women completed clinical exams and were considered enrolled in the SALSA study. This report presents data for the women ($n = 432$) who responded to questions on urinary incontinence ($n = 421$, 97.4%). All participants gave informed consent and approval of this study was done through the institutional review board at The University of Texas Health Science Center, San Antonio, Texas.

2.2. Self-reported urinary incontinence

All subjects were asked the question: "Over the past 12 months, how often do you have difficulty holding your urine until you can get to a toilet?" Responses included "never, hardly ever, some, most or all of the time." Subjects were considered to have urinary incontinence if they responded "some, most, or all of the time."

2.3. Variables

Demographic variables included age, years of education, marital status, and annual household income. The presence of doctor-diagnosed medical conditions, including diabetes, cardiovascular disease, stroke, osteoarthritis, and cancer (other than skin) were assessed by self-report. Systolic and diastolic blood pressures (calculated with a random-zero sphygmomanometer using appropriate cuff size) and fasting blood glucose were obtained to establish the diagnoses of uncontrolled hypertension and diabetes. Hypertension was defined by Joint National Committee 6 (JNC 6) guidelines and diabetes by the 2004 American Diabetes Association (ADA) guidelines (JNC, 1997; ADA, 2004). Body mass index (BMI), calculated as weight in kilograms divided by height in meters squared, was measured during the home based assessment. Diuretic usage was ascertained by medication review. Presence of fecal incontinence was ascertained with the question: "In the past few months, have you ever lost control of your bowels when you didn't want to?" Responses were dichotomized as "yes" and "no."

Cognition was measured with the Mini-mental State Examination (MMSE) (Folstein et al., 1975). Total scores were used as a continuous variable. Seven basic activities of daily living (ADLs) were assessed using a modified Katz scale and seven instrumental activities of daily living (IADLs) were assessed using the modified Older Americans Resources and Services (OARS) scale (Katz et al., 1970; Fillenbaum, 1985). ADLs were scored as the sum of items on which any difficulty was reported; IADLs were scored as the sum of items on which any dependence was reported. Scores were calculated as the sum of items on which any difficulty was reported.

The 30-item Geriatric Depression Scale (GDS) measured depressive symptoms; total scores were used in the analysis (Yesavage et al., 1983). Participants were considered smokers if they had smoked more than fifty cigarettes in their lifetime. Current alcohol usage (any versus none) was included in the analysis because of potential diuretic effects that may affect bladder control. Other variables included hysterectomy status, hormone usage (ever or from the time of

hysterectomy or oophorectomy), and number of children. Questions about gravidity and parity were not part of the questionnaire.

2.4. Translation techniques

All assessments were administered in the participant's preferred language (English or Spanish). For questions on urinary and fecal incontinence, standard cross-cultural translation techniques were used to translate questions into Spanish. Specifically, two fluent Spanish-English speakers independently translated the English versions into Spanish and then met to resolve any differences and arrive at a single Spanish version for each question. The agreed upon Spanish versions were then back-translated into English by a third fluent Spanish-English speaker who was blinded to the original English versions. Any discrepancies were resolved to produce the final Spanish version. Both the Spanish and English versions were pre-tested in a focus group of older MAs and EAs prior to beginning the study.

2.5. Statistical analysis

Ethnic differences in study variables, as well as differences in study variables between those with and without urinary incontinence, were examined with *t* tests for continuous variables and contingency tables (χ^2) for categorical variables. Separate multivariable logistic regression models were used to assess predictors of urinary incontinence while adjusting for other confounding variables with a *p* value of <0.1 on univariate analysis. Final multivariable model was then adjusted for education (years), neighborhood, and income dichotomized as ≤\$12,000 or >\$12,000. Model fit was evaluated using the Hosmer-Lemeshow goodness-of-fit statistic.

An approximate Bayesian bootstrap multiple imputation hotdeck procedure was used to impute missing variables and pool parameter estimates from the logistic models (Rubin and Schenker, 2001). Less than 5% of missing values for GDS scores, grip strength, and ADLs scores were imputed. Final models with imputed values did not change the results of our multivariable models. Interaction terms between ethnicity/disability, ethnicity/depression, ethnicity/age, and ethnicity/neighborhood were also included in the analyses, and no significant interactions were found. We report results only for the unimputed multivariable logistic models without interaction terms. All analyses were performed using STATA 8.0 (College Station, TX).

3. Results

Demographic and health characteristics of subjects are shown in Table 1 by ethnic group. Average age for the cohort was 69.1 ± 3.3 years with EA women being slightly older (69.6 ± 3.5) than MA women (68.7 ± 3.1 , $p < 0.001$). Overall, MA women compared with EA women, were less educated, had lower income, more diabetes, and higher BMIs (Table 1). Overall prevalence of urinary incontinence was 37%, with EA women having a higher prevalence than MA women, 45% and 29% ($p = 0.001$), respectively. To further characterize ethnic differences, women in each ethnic group were analyzed separately.

In subgroup analysis by ethnicity (Table 2), factors associated with urinary incontinence differed among EA women and among MA women. EA women with urinary incontinence compared to EA women without incontinence were more likely to be greater than 75 years of age, have had a myocardial infarction or a history of prior cancer (excluding skin cancer), depressive symptoms, to use more medications (especially diuretics), and have more dependency. Although EA women with incontinence had higher rates of diabetes than their continent counterparts (13% vs. 9%), they had significantly lower rates of diabetes than the MA women with and without incontinence (39% vs. 27%).

In MAs, women with urinary incontinence compared to those without incontinence had lower income, higher average BMI, more angina symptoms, more diuretic use, more self-reported fecal incontinence, more depressive symptoms, lower MMSE scores, lower self-perceived health status, and more dependency. In incontinent MAs in comparison to incontinent EAs, high prevalence rates of co-morbid, uncontrolled hypertension (45% vs. 38%) and diabetes (39% vs. 13%) existed but did not affect the self-report of urinary incontinence in either group of women (Table 2). Hysterectomy and current use of estrogen appeared to be protective for urinary incontinence in MAs, but not EAs. Overall, more EA than MA women (54% vs. 39%, $p < 0.05$) had a history of hysterectomy with incontinent EA women (63%) having higher rates of hysterectomy than incontinent MA women (56%, Tables 1 and 2). The number of children among women did not differ by continence status in either ethnic group, although MA women (3.7 ± 2.7) had more children ($p < 0.001$) in comparison to EA women (2.2 ± 1.5).

Factors associated with urinary incontinence using multivariable regression analysis differed between ethnic groups (Table 3). In EAs, age greater than 75 was the only factor that correlated with urinary incontinence. In contrast, MA women with fecal incontinence were four times more likely to have urinary incontinence. MA women with increasing dependency in ADLs had 40% increased odds of having urinary incontinence in comparison to MA women with less dependency. However, age did not impact incontinence in MA women when controlling for other factors. For both EA and MA women, depressive symptoms were not correlated with urinary incontinence, despite significant differences ($p < 0.001$) at the univariate level. For MA women, BMI did not correlate with incontinence in the multivariable model. No significant differences were found when multivariable models were adjusted for education, neighborhood or income (Table 3).

4. Discussion

Overall, the prevalence of urinary incontinence in this cohort was 37%. This rate is similar to that found in other cohort studies of women in the United States using similar self-reported data to assess urinary incontinence (Wetle et al., 1995; Nygaard and Lemke, 1996). Despite MA women with higher rates of diabetes, higher BMIs, and more parturition risk factors for urinary incontinence than EA women in this cohort, only two factors, fecal incontinence and dependency in ADLs, correlated with urinary incontinence in MA women. However, age was the only factor in EA women that was associated with urinary incontinence when adjusting for other risk factors.

The correlates of urinary incontinence seen among the MA women, but not the EA women, may represent two separate factors that impact incontinence in MAs. The first factor, the co-existence of fecal incontinence, may impact reporting of urinary incontinence among the MA women. MA women may be more likely to report urinary incontinence, if they were also affected by fecal incontinence. Fecal incontinence in women with urinary incontinence has been shown to have a greater impact on quality of life than isolated urinary incontinence (Fialkow et al., 2003). Also, having both urinary and fecal incontinence may result from pelvic floor injury. MA women in this study may be at a higher risk for pelvic floor injury due to parturition factors, having more obesity, and higher rates of diabetes resulting in peripheral neuropathy. Secondly, MA women who also reported dependency in ADLs may have severe physical limitations that affect their ability to toilet, thus resulting in urinary incontinence. In a study in older, Hispanic adults, incident urinary incontinence was associated with physical limitations, including ADLs dependency (Miles et al., 2001).

Rates of urinary incontinence vary by both the definition and question used to identify incontinence types. The question used in this cohort assessed "difficulty in holding urine," and may not represent all types of urinary incontinence. However, the question combines

mechanisms involved in maintaining continence, such as mobility and urgency. Difficulty holding urine until reaching a toilet may represent mainly urge incontinence, which is the most common type of incontinence seen in older adults (Thom and Brown, 1998). When compared to another population-based study of incontinence in older Hispanic women, our findings indicate a two-fold higher incontinence prevalence (29% versus 15%), using the same interview question (Espino et al., 2003). However, in comparison to EAs in this cohort, fewer MA women (29% versus 45%) reported incontinence. The rate observed in EA women for self-reported urine loss was similar to previous observations in white community-dwelling women (Wetle et al., 1995; Nygaard and Lemke, 1996). Overall, the rate of incontinence in MA women (29%) in this study is lower than recent data from NHANES study (36%) and may be due to the question used “In the past 12 months, have you had difficulty controlling your bladder, including leaking small amounts of urine when you cough or sneeze” which addresses more symptoms of stress urinary leakage (Anger et al., 2006).

In clinical studies comparing younger Hispanic and white women with stress incontinence, the prevalence in the two groups was similar (Mattox and Bhatia, 1996; Duong and Korn, 2001; Sze et al., 2002). One study found higher rates of self-reported stress urinary incontinence in middle-aged, Hispanic women compared to white women, but no differences were seen on urodynamic diagnosis of urinary incontinence (Mattox and Bhatia, 1996). Given the survey question used in this study, true differentiation of urinary incontinence types in MA women could not be assessed.

Socioeconomic status can affect access to health care, health and functional status. It can also influence the way health conditions are discussed or reported. EAs in this sample were more educated and had higher incomes than did MAs. Although it appears that MAs were less likely to be incontinent, they may have been less likely to report incontinence. For example, other studies involving women in different ethnic groups have indicated more reporting of urinary incontinence symptoms with more education (Burgio et al., 1996; Anger et al., 2006). Cultural differences might also account for differences in incontinence reporting. Although not limited to MA women, these differences may include gender issues in discussing incontinence with providers and the recognition of incontinence as not a normal part of aging (Burgio et al., 1994). Overall, these issues may reflect the lower rates of women seeking outpatient evaluation for incontinence, despite high rates of incontinence prevalence seen in population based surveys. It is also possible that MAs who were administered the English or Spanish questionnaire (“How often do you have difficulty holding your urine until you can get to a toilet?” or “¿Qué tan seguido ó a menudo tiene usted dificultad en detener ó controlar la orina hasta que pueda llegar al baño”) interpreted this question differently than did EAs. This question has not been formally validated among MA women who speak Spanish, despite application of cross cultural adaptation methods for the Spanish question used in this cohort.

Several possible explanations exist for the difference in reported urinary incontinence between MAs and EAs. First, our study did not assess all potential risk factors for urinary incontinence in a comprehensive manner since this was a secondary data analysis of a cohort established to study the disablement process. As an example, detailed information about gravidity, parity, gynecologic and urologic conditions or surgeries is not available. Instead, some proxy indicators were used, such as the number of children. Pelvic surgery, other than hysterectomy, was not assessed in this cohort. Also, it is possible that correlates vary by type of urinary incontinence. The survey question used in this study does not allow differentiation of urinary incontinence types. Finally, it is also possible that anatomical and genetic influences affect urinary incontinence differently in these ethnic groups. Without additional study, it is not possible to say whether any of these alternative explanations apply.

5. Conclusion

Urinary incontinence is prevalent in both ethnic groups in this study, EAs in particular. More research is needed to determine urinary incontinence risk factors and prevalence among MAs and to explore reasons for any differences from other ethnic groups.

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Table 1

Demographic and clinical characteristics of EA and MA women in the SALSA study

Variable	EA women (n=201)	MA women (n=220)
Age (years)	69.6 ± 3.5	68.7 ± 3.1 ^a
Neighborhood		
Barrio	--	135 (61)
Transitional	116 (58)	46 (21)
Suburb	85 (42)	39 (17) ^{a,b}
Married	110 (55)	122 (56)
Income <\$12,000 per year	34 (17)	116 (53) ^a
Years of education	12.9 ± 2.4	8.0 ± 4.5 ^a
BMI (kg/m ²)	27.5 ± 5.8	29.9 ± 5.3 ^a
Diabetes	19 (11)	62 (30) ^a
Hypertension	80 (40)	86 (39)
Urinary incontinence	90 (45)	64 (29) ^a
Fecal incontinence	21 (11)	13 (6)
Poor self-perceived health	24 (12)	74 (34) ^a
Reproductive Factors		
Children	2.2 ± 1.5	3.7 ± 2.7 ^a
Hysterectomy	107 (54)	85 (39) ^a
Current estrogen use	49 (25)	63 (29)

Data are presented as n (%) or mean ± SD

^a p value <0.05^b p value for trend

Table 2

Demographic and clinical characteristics of EA MA women with and without urinary incontinence in the SALSA study

Variable	EA women (n=201)		MA women (n=220)	
	Never/ hardly ever (n=111, 55%)	Some/Most/All (n=90, 45%)	Never/ hardly ever (n=156, 71%)	Some/Most/All (n=64, 29%)
Age >75 (years)	5 (5)	17 (19) ^a	5 (3)	6 (9)
Age (years)	69.1 ± 3.2	70.2 ± 3.8 ^a	68.6 ± 3.0	69.0 ± 3.3
Neighborhood				
Barrio	--	--	92 (59)	43 (67)
Transitional	61 (53)	55 (47)	29 (19)	17 (27)
Suburb	50 (59)	35 (41)	35 (22)	4 (6) ^{a, c}
Lives alone	37 (33)	33 (37)	26 (17)	9 (14)
Married	66 (59)	44 (49)	85 (55)	37 (58)
Income <\$12,000 per year	18 (16)	16 (18)	84 (54)	32 (50) ^a
Years of education	13.0 ± 2.6	12.7 ± 2.2	8.3 ± 4.5	7.2 ± 4.9
BMI (kg/m ²)	26.8 ± 5.1	28.4 ± 6.5	29.1 ± 4.8	32.0 ± 5.8 ^a
Current alcohol drinker	53 (47)	32 (36)	34 (22)	11 (18)
Ever smoked regularly	59 (53)	35 (40)	102 (66)	38 (61)
Medical Conditions ^b				
Angina	7 (6)	8 (9)	9 (6)	10 (16) ^a
Stroke	6 (5)	8 (9)	9 (6)	9 (14)
Diabetes	8 (9)	11 (13)	39 (27)	23 (39)
Hypertension	46 (41)	34 (38)	58 (37)	28 (45)
Myocardial infarction	3 (3)	11 (12) ^a	12 (8)	4 (6)
Cancer	22 (20)	6 (7) ^a	10 (6)	4 (6)
Arthritis	57 (51)	58 (65)	80 (51)	32 (51)
Osteoporosis	17 (15)	18 (20)	11 (7)	11 (17)
Diuretic use	13 (12)	21 (23) ^a	20 (13)	16 (25) ^a
Fecal incontinence	10 (9)	11 (12)	5 (3)	8 (13) ^a
Depressive symptoms (GDS score)	4.8 ± 4.5	7.1 ± 4.8 ^a	6.3 ± 5.1	9.0 ± 5.8 ^a
MMSE total	27.7 ± 2.2	27.5 ± 2.4	24.7 ± 3.8	23.1 ± 4.5 ^a
Poor perceived health	9 (8)	15 (17)	43 (28)	31 (51) ^a
Number of medications	2.7 ± 2.4	4.0 ± 2.8 ^a	2.3 ± 2.0	2.9 ± 2.8
Functional Characteristics				
Dependency in ADLs	0.04 ± 0.25	0.27 ± 1.0 ^a	0.2 ± 0.6	0.6 ± 1.2 ^a
Dependency in IADLs	0.07 ± 0.35	0.20 ± 0.5 ^a	0.3 ± 0.7	0.7 ± 0.9 ^a
Reproductive Factors				
Children	2.1 ± 1.5	2.3 ± 1.5	3.7 ± 2.7	3.5 ± 2.8
Hysterectomy	51 (46)	56 (63) ^a	96 (62)	35 (56)
Current estrogen use	32 (25)	17 (24)	51 (33)	12 (19) ^a

Variable	EA women (n=201)		MA women (n=220)	
	Never/ hardly ever (n=111, 55%)	Some/Most/All (n=90, 45%)	Never/ hardly ever (n=156, 71%)	Some/Most/All (n=64, 29%)

Data are presented as n (%) or mean ± SD

^a p<0.05 for the comparison between those with and without urine loss

^b Self-reported, except diabetes (ADA criteria), angina (Rose criteria), and hypertension (JNC 6 criteria)

^c p value for trend

Table 3
Multivariate logistic regression analyses of women with and without urinary incontinence according to ethnicity

Factors associated with urinary incontinence	EA women, n= 201			MA women, n = 220		
	OR ^a	95% CI	OR ^b	95% CI	OR ^b	95% CI
Age >75 (years)	4.2	1.4, 12.4	4.8	1.6, 14.6	2.3	0.6, 9.1
Body mass index (kg/m ²)	1.0	1.0, 1.1	1.0	1.0, 1.1	1.1	1.0, 1.2
Fecal incontinence	0.9	0.3, 2.6	0.9	0.3, 2.5	4.0	1.1, 14.0
Dependency in ADLs	1.8	0.9, 3.4	1.8	0.9, 3.4	1.4	1.1, 1.8
Depressive symptoms (GDS)	1.1	1.0, 1.2	1.1	1.0, 1.2	1.1	1.0, 1.1

OR, odds ratio; CI, confidence interval; ADL, activities of daily living; GDS, geriatric depression scale

^aThe reference group in each model is continent women of the same ethnicity.

^bMultivariable model adjusted for education (years), neighborhood (barrio, transitional, suburb), and income (≤\$12,000 or >\$12,000)