Urinary incontinence, related factors and menopause-related quality of life in mid-aged women assessed with the Cervantes Scale

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ARTICLE INFO

ABSTRACT

Objective: To determine urinary incontinence (UI) prevalence, related factors and menopause-related quality of life (QoL) in mid-aged Colombian women.
Methods: A total of 1739 women aged 40–59 were surveyed with the 31 item Cervantes Scale (CS) and a socio-demographic questionnaire. Item 18 of the scale was used to categorize the degree of UI. Remaining 30 items (Adjusted global score) were used to assess global menopause-related QoL.
Results: Median age of the sample was 46 years. A 26.0% of women presented some degree of UI, rated as moderate to severe in 16.4% of cases. Adjusted global CS scores (excluding item 18) significantly increased with the severity of UI. Mean scores for item 18 were found to be significantly higher in relation to age, menopausal status, body mass index values, lower education and unemployment status. Multiple linear regression analysis determined that age, postmenopausal status and ethnicity (Mestizo) were significantly related to higher item 18 scores, and thus more severe UI.
Conclusion: This is the first study to report UI prevalence in a large mid-aged Latin American female population in which age, menopausal status and ethnicity were related factors.

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1. Introduction

Urinary problems are frequently encountered around the menopause, in part related to estrogen secretion [1,2]. These complaints include urinary incontinence (UI) and urgency, recurrent infections and voiding dysfunction [1–4]. Urogenital tissue may display sensitivity responses varying in accordance to different estrogen levels [5]. Decreased estradiol levels may cause bladder dysfunction and reduce urethral closure which may contribute or exacerbate an existing UI [3,4,6,7]. Despite this, several reports have failed to demonstrate that hormone therapy (HT) improves urinary symptoms (i.e. incontinence, urge syndrome) in postmenopausal women [7–11]. Important to state is that subjective sensation related to UI does not always correlate with urodynamic findings [12].

Voiding symptoms may impair quality of life (QoL). Thus, QoL scales have been designed to appropriately assess physical and the emotional effects of urinary symptoms [13,14]. In addition, several of the available menopause-related QoL instruments include items that assess urinary symptoms [15–18], while others do not [19,20]. Despite the availability of these tools, information regarding UI, related factors and menopause related QoL in mid-aged women is scarce. We have recently reported the use of the Cervantes Scale (CS), a 31-item instrument, to assess menopause related QoL in a large cohort of mid-aged Colombian women [18]. The present brief report aimed at re-analyzing the data base of this cohort focusing on item 18 of the CS which assesses UI in order to determine its prevalence, related factors and menopause-related QoL.

2. Methods

2.1. Design and participants

The present research constitutes a re-analysis of the data base of a large cohort of mid-aged women (40–59 years) who were previously surveyed with the CS [18]. In brief, door-to-door visits were carried out by trained personnel in communities of

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Barranquilla, Cartagena, Cali, Bolivar and Valle Departments. Participants were informed about the research, its purpose, the CS and its content and requested to give written consent of participation. More details regarding the methodology used in the original study can be found elsewhere [18]. The Institutional Review Board of the Cartagena University, Cartagena, Colombia reviewed and approved the research protocol.

2.2. Survey

Personal data of the questionnaire included: age, parity, menopausal status, current HT use, educational level, marital status, and current smoking habit. Menopausal status was defined using criteria of the Stages of Reproductive Aging Workshop [21]. Those with bilateral oophorectomy were considered as postmenopausal.

Women capable of performing daily routine activities were defined as healthy [22]. Body mass index (BMI) was calculated as weight in kilograms divided by squared height in meters. BMI values were categorized as low ($<18.50 \, kg/m^2$), normal ($18.50–24.99 \, kg/m^2$) or increased ($\geq 25.00 \, kg/m^2$). Increased BMI values were used to define women as being overweight ($\geq 25.00–29.99 \, kg/m^2$) or obese ($\geq 30.00$) [23].

2.3. The Cervantes Scale

The CS is a questionnaire that measures in the past 4 weeks menopausal health-related QoL among mid-aged women. It contains 31 items or questions (positive and negative ones) grouped into four categories or domains: 'Menopause and Health'; 'Psychological'; 'Sexuality' and 'Couple Relationship'. Each item is scored in a Likert fashion from 0 (not present) to 5 (very much), hence from better to worse, for 'negative questions'. Scores are inversed for 'positive questions'. Items are then summed up to create a global score and four different domain scores. More details on scoring system of the scale may be found elsewhere [18]. Higher global CS scores denote worse QoL [17,18]. The present re-analysis focused on item 18 which explores the presence and severity of UI. Item 18 literally says: *"I am afraid of performing physical efforts because my urine leaks"*.

2.4. Statistical analysis

Statistical analysis was performed using SPSS statistical package (Version 19.0, IBM, Armonk, NY, USA). Data are presented as means, standard deviations, percentages, coefficients and confidence intervals. Normality of data distribution was assessed with the Kolmogorov–Smirnov test. According to this, continuous data were compared with the Student T test (two parametric independent samples) or ANOVA (various parametric independent samples). The Rho Spearman coefficient was calculated to determine the correlation between item 18 scores and adjusted global CS scores (which excludes values for item 18).

Multiple linear regression analysis was performed to assess variables related to higher CS item 18 scores and hence worse UI. Scores obtained with item 18 were considered the dependent variable. Model was constructed using independent variables achieving $p = 0.10$ at bivariate analysis, among these: female age, parity, menopausal status, ethnics, BMI, smoking habit, educational level, HT use, and marital and employment status. Entry of variables into the model was performed using a stepwise procedure. A p value <0.05 was considered as statistically significant.

Table 1
Basal characteristics and scores obtained with item 18 of the CS (urinary incontinence) of the studied population ($n = 1739$).

	n (%)	Item 18
All	1739	0.59 [1.21]
Age (years)		
<45	526 (30.2)	0.30 [0.88]
45–54	852 (49.0)	0.59 [1.18]
55–59	361 (20.8)	1.0 [1.52]
p value[*]		0.0001
Parity		
Nulliparous	104 (6.0)	0.60 [1.10]
1–2	722 (41.5)	0.59 [1.24]
≥3	913 (52.5)	0.59 [1.19]
p value		0.387
Mestizo		
Yes	1202 (69.1)	0.66 [1.25]
No	537 (30.9)	0.44 [1.10]
p value		0.0001
Menopausal status		
Premenopausal	614 (35.3)	0.35 [0.91]
Perimenopausal	448 (25.8)	0.41 [1.07]
Postmenopausal	677 (38.9)	0.92 [1.44]
p value		0.0001
Hormone therapy		
Yes	115 (6.6)	0.67 [1.23]
No	1624 (93.4)	0.58 [1.21]
p value		0.215
Body mass index (kg/m^2)		
<18.50	58 (3.3)	0.53 [1.06]
18.50–24.99	749 (43.1)	0.51 [1.15]
25–29.99	684 (39.3)	0.66 [1.23]
≥30	248 (14.3)	0.65 [1.34]
p value		0.02
Smoking habit		
Yes	117 (6.7)	0.59 [1.25]
No	1622 (93.3)	0.59 [1.20]
p value		0.719
Education (years)		
<5	271 (15.6)	0.64 [1.27]
5–10	621 (35.7)	0.73 [1.35]
>10	847 (48.7)	0.47 [1.06]
p value		0.001
Married/cohabiting		
Yes	1206 (69.4)	0.55 [1.17]
No	533 (30.6)	0.67 [1.29]
p value		0.09
Employed		
Yes	768 (44.2)	0.49 [1.08]
No	971 (55.8)	0.66 [1.29]
p value		0.01

Degrees of urinary incontinence (item 18)	n (%)	Adjusted Global CS score[**]
0–1 (no or mild urinary incontinence)	1454 (83.6)	45.74 [17.88]
2–3 (moderate urinary incontinence)	194 (11.2)	60.06 [16.66]
4–5 (severe urinary incontinence)	91 (5.2)	65.61 [21.82]
p value		0.0001

Data are presented as mean [standard deviations], or percentages, n (%).

[*] p values as determined with the ANOVA or the Student T test.
[**] values for item 18 were excluded.

3. Results

During the study period a total of 1844 women were asked to participate. A 3% denied participation and 2.7% provided incomplete data, leaving a total of 1739 complete surveys for final analysis. Basal characteristics of surveyed women and scores obtained with item 18 of the CS in accordance to these features are depicted on Table 1. In addition, adjusted global CS scores (excluding item 18 scores) in relation to the degree of UI rated by

Table 2
Factors relating to higher item 18 CS scores: multiple linear regression analysis.

Item 18 of the Cervantes Scale	Regression coefficients	Standard error	95% CI	p value
Postmenopausal stage[*]	0.17	0.04	0.08–0.25	0.0001
Ethnics (Mestizo)[*]	0.22	0.06	0.09–0.34	0.001
Age	0.02	0.006	0.01–0.03	0.0001

$r = 0.39$, adjusted $r^2 = 0.40$, $p < 0.0001$; CI: confidence intervals.

[*] Reference group is that without the depicted condition: in case of ethnics it is compared to black and for postmenopausal it is compared to pre- and peri-menopausal.

item 18 are also depicted on Table 1. Median age of the sample was 48 years. Mean scores for item 18 were found to be significantly higher in relation to age, ethnicity, menopausal status, BMI index values, lower education and unemployment status. A 26.0% of surveyed women presented some degree of UI, rated as moderate to severe in 16.4% of cases. Adjusted global CS scores significantly increased with severity of UI. Coefficient correlation between adjusted CS global and item 18 scores was significantly positive ($r^2 = 0.78$, $p = 0.001$). Multiple linear regression analysis was used to obtain a best-fit model identifying factors correlating to higher item 18 scores (Table 2), and thus more severe UI. Age, ethnicity and postmenopausal stage significantly related to higher item 18 scores.

4. Discussion

UI is the unintentional loss of urine which affects women more frequently than men. Its prevalence increases during pregnancy and postpartum or after the menopause, due to the weakening of the pelvic muscles. Neural damage, some medications and diets, caffeine consumption, and age may worsen the condition and impair QoL [1,4]. The CS questionnaire was designed to assess menopausal symptoms and QoL through 31 items, including UI [18]. The present re-analysis determined that one fourth of surveyed women presented some degree of UI, with 16.4% rating it as moderate to severe, data that is in agreement with other reports [4,24]. Most interesting was finding that adjusted global CS scores displayed an increasing trend in relation to the severity of incontinence, thus implicating a worse QoL. Due to recurrent genitourinary infections many women during the postmenopausal period suffer aggravation of their UI and thus general worsening of QoL [25,26]. Unfortunately the present cohort did not explore other confounding factors such as urinary tract infections or co-morbidity.

Our multivariate regression model determined that age, postmenopausal status and mestizo ethnicity (as compared to black) were factors related to more severe UI, explaining 40% of the total variance. These delineated UI risk factors were similar to those previously reported by others [27]. BMI, was however excluded from the final model. Aging and the menopause per se are associated with a progressive increase in the severity of UI and discomfort [28]. Despite this, serum estradiol has not been related to UI during the menopause transition [29,11], or with urodynamic parameters [30].

Previous studies have suggested that collagen, estrogen and androgen-related polymorphisms may determine the differences in the prevalence of UI described in the literature [31–33]. There are also some reports highlighting the influence of race over the prevalence of UI. Indeed our group has previous reported more severe urogenital Menopause Rating Scale subscale scores among Latin American indigenous postmenopausal women [34]. In this report, Afro-Colombian women displayed lower (better) urogenital scores as compared to mestizo ones. A multiethnic American series also supports ethnical differences found in the prevalence of UI. Indeed prevalence was higher in non-Hispanic white women as compared to non-Hispanic black or Mexican-American ones [24].

Our re-analysis is subject to the known limitations inherent to cross sectional studies. Interesting would have been to include a specific UI related QoL tool and clinical assessment through urodynamics, in order to aid in classifying the different types of UI [35]. This would have also provided insights on the reliability of item 18 of the CS in determining the degree of UI severity. This may be seen as a potential limitation; however, this was not the primary aim of the study. In any case, one must bear in mind, as already mentioned, that urinary leaking not always correlates with QoL [36]. Not assessing co-morbid conditions leading to UI may also be seen as a drawback.

Despite the aforementioned limitations, our cohort may be in fact the largest ever to provide data on UI in Latin American women using a specific menopause-related QoL tool, providing UI prevalence, related factors and the relation to global QoL scores. The prevalence of moderate to severe UI in this cohort of mid-aged Colombian women was 16.4% in which age, menopausal status and ethnicity were related factors. More research is warranted with the Cervantes tool to determine its utility for the screening of UI.

Contributors

FRPL, JLC and RSB were involved in conception and design of the analysis. AMC was responsible of data acquisition. AMFA and PC performed the statistical analysis. FRPL and PC did the drafting of the manuscript. All authors were involved in critically revising the manuscript for its intellectual content; and the final approval of the manuscript was done by all authors.

Competing interest

The authors have no competing interests.

Funding

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