Analysis of the prevalence of and factors associated with urinary incontinence among elderly people in the Municipality of São Paulo, Brazil: SABE Study (Health, Wellbeing and Aging)

Análise da prevalência e fatores associados à incontinência urinária entre idosos do Município de São Paulo, Brasil: Estudo SABE (Saúde, Bem-Estar e Envelhecimento)

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Abstract

To investigate the prevalence of urinary incontinence among elderly people living in São Paulo, Brazil and their associated risk factors. The Pan-American Health Organization and World Health Organization coordinated a multicenter study named Health, Wellbeing and Aging *(SABE Study) in elderly people (over 60 years old) living in seven countries in Latin America and the Caribbean. In Brazil, the study was carried out in São Paulo in the year 2000. The total Brazilian sample included 2,143 people. The prevalence of self reported urinary incontinence was 11.8% among men and 26.2% for women. It was verified that among those reporting urinary incontinence, 37% also reported stroke and 34% depression. It was found that the greater the dependence that the elderly people presented, the greater the prevalence of urinary incontinence. The associated factors found were depression (odds ratio = 2.49), female (2.42), advanced age (2.35), important functional limitation (2.01). Urinary incontinence is a highly prevalent symptom among the elderly population of the municipality of São Paulo, especially among women. The adoption of preventive measures can reduce the negative effects of urinary incontinence.*

Urinary Incontinence; Risk Factors; Aged

Introduction

During the period from 1980 to 2025, the population aged 60 years and over in Latin America and the Caribbean is expected to at least double in size and, in more than half of these countries, to triple in size [1]. This rapid and accentuated aging of the population will have a significant impact on social, economic and health demands. Prominent among health demands will be those relating to chronic diseases and their incapacitating sequelae and other complaints such as urinary incontinence, which are all included among the so-called "giants of geriatrics", given the negative consequences they have on quality of life among elderly people [2].

A wide spectrum of urinary incontinence prevalence rates exists in the literature, ranging from 2.5% to 60%. The reasons for these divergences lie in variations in the definitions for urinary incontinence, differences in population samples and differences in formulating questions [3]. The variation in these results makes it difficult to reach more precise conclusions regarding disease prevention or therapeutic options [4]. In Brazil, epidemiological studies on urinary incontinence are also still scarce.

The aim of the present study was to investigate the prevalence of complaints of urinary incontinence among elderly Brazilians living in the community and their associated risk factors for urinary incontinence.

Materials and methods

The Pan-American Health Organization (PAHO) and World Health Organization (WHO) coordinated a multicenter study named Health, Wellbeing and Aging (the SABE Study), to outline the living conditions and health of elderly people living in seven countries in Latin America and the Caribbean. The countries participating in this study were Argentina, Barbados, Brazil, Chile, Cuba, Mexico and Uruguay. In Brazil, the study population was composed of elderly people (over 60 years old), living in the municipality of São Paulo in the year 2000 [5].

The total Brazilian sample of 2,143 elderly people was made up of two segments. The first resulted from a selection and was a probabilistic sample made up of 1,568 interviewers. The second consisted of 575 elderly people living in the districts in which the previous interviews had been held, and was an additional sample obtained to compensate for deaths among the population of individuals over 75 years old and to make up the desired number of interviews within this age group. To select the homes for the sample, a two-stage cluster sampling method was used, with the criterion of allocation proportional to size. The minimum number of homes drawn in the second stage was approximated to 90. Making up the sample of individuals aged 75 years and over was done by means of locating homes close to the selected census tracts or at least within the limits of the districts to which the drawn census tracts belonged.

The data were collected simultaneously, by means of home interviews, using a standardized instrument consisting of eleven thematic sections: personal data, cognitive assessment, health status, functional status, medications, use of and access to services, family and social support networks, work history and sources of income, characteristics of the home and flexibility and mobility tests. Every eligible person living in a selected household was interviewed.

Most of the interviews (88%) were conducted directly. For the remainder, when it was seen that it was impossible for the elderly person to answer the questions because of physical or cognitive problems, a proxy respondent was used. A detailed description of the methodology used is available at PAHO (http://www.opas.org.br/publicmo. cfm?codigo=70).

To develop the present study, sections A (personal data), C (health status) and K (anthropometry) were used. The presence of urinary incontinence was taken to be a dependent dichotomous variable, and this was ascertained as the response "yes" to the question "*Have you unintentionally wet yourself on any occasion during the last 12 months?*".

In this study, individuals were defined as presenting difficulty in doing daily activities if an affirmative response was given to at least one of the questions referring to difficulties in performing IADL (instrumental activities of daily life: managing money; going out alone; shopping for food; using the telephone and taking medicines) or BADL (basic activities of daily living: walking across a room, eating, lying down on a bed and getting up from it, using the bathroom, dressing and undressing, and bathing). Difficulty in mobility was measured as 1 (difficulty present) if the person refused or was unable to do any of the nine mobility tests offered in the interview, and 0 (no difficulty present) if one or more of the tests were undertaken.

To study the possible influence of these variables on urinary incontinence, the categories "Does not know" and "No response" were disregarded and were then considered to be missing values. All the variables were transformed into binomials (two categories), except for body mass index (BMI), for which four variables of dummy type were created.

Body mass index 1 (BMI1) had the values of: 0 = did not belong to the low BMI category, and 1 = belonged to the low BMI category.

The other three dummy variables were defined in the same way. The "normal" BMI category was taken to be the reference for comparisons with the others. The effect of independent variables was evaluated by means of odds ratios, which were adjusted using binomial logistic regression, with urinary incontinence as the binary response. Odds ratios with $p < 0.05$ were taken to be significant. It must be noted that the probability of type I error may be increased due to multiple comparisons adopted in the multivariate analysis. The procedures were weighted according to the sample fractions that resulted from the design effect. The statistical method used was multivariate logistic regression by means of a backward stepwise procedure. The p-value for a variable to remain in the process was adopted as 0.05.

Data from the sample, expanded to the population base using the statistical packages SPSS (SPSS Inc., Chicago, USA) and Stata (Stata Corp., College Station, USA), were used to describe the frequencies of the variables of interest.

The SABE Study was submitted to the respective ethics committees in the countries involved. In Brazil, the study was approved by the Ethics Committee of the School of Public Health at the University of São Paulo and by the National Research Ethics Commission (CONEP).

Results

Table 1 shows the distribution of elderly people with urinary incontinence according to sociodemographic variables, health status and functional status. Greater prevalence of urinary incontinence was observed at more advanced ages, among women, among individuals who said their ethnicity was non-white and among those with lower schooling.

With regard to reported health conditions, there was a greater prevalence of elderly people who said their health was regular or poor. Among the diseases reported, the greatest prevalences of urinary incontinence related to the presence of stroke, depression, diabetes and extremes of BMI (low weight and obesity). With regard to functional capability, it was seen that the greater the dependence that the elderly people presented, the greater the prevalence of urinary incontinence was. When the relative-frequency data were put into the multivariate logistic regression model, the analysis showed that these data were significant and thus presented high odds ratios for the occurrence of urinary incontinence (Table 2).

Table 1

Distribution of elderly people according to the presence of urinary incontinence, sociodemographic variables, health status and functional status. Municipality of São Paulo, Brazil, 2000.

	60 to 74 years presence of urinary incontinence		75 years and over presence of urinary incontinence	
	Yes	No	Yes	No
Sociodemographic variables				
Age group	16.5	83.5	33.3	66.7
Sex				
Male	8.9	91.1	23.8	76.2
Female	22.2	77.8	38.6	61.7
Self-reported ethnicity				
White	15.5	84.5	33.3	66.7
Non-white	18.8	81.2	33.6	66.4
Schooling (years)				
Up to 3	18.2	81.8	36.2	63.8
4 or more	15.3	84.7	28.6	71.4
Health status				
Self-reported diseases/conditions				
Diabetes mellitus	23.8	76.2	42.4	57.6
Arterial hypertension	19.9	80.1	36.2	63.8
Chronic obstructive pulmonary disease	20.7	79.3	35.8	64.2
Stroke	31.1	68.9	54.6	45.4
Depression	31.2	68.8	49.8	50.2
Self-reported health status				
Excellent/Very good/Good	7.1	92.9	22.5	77.5
Regular/Poor	25.0	75.0	41.6	58.4
Body mass index				
Low	15.8	84.2	34.2	65.8
Normal	14.7	85.3	26.6	73.4
Overweight	11.9	88.2	36.8	63.2
Obese	24.3	75.7	43.8	56.2
Functional status				
Difficulty in				
Mobility in general	27.2	72.8	60.4	39.6
Going to the bathroom alone	45.1	54.9	73.1	26.9
Doing basic activities of daily living	32.7	67.3	56.5	43.5
Doing instrumental activities of daily living	18.4	81.6	35.7	64.3

Discussion

An aging population is a reality for many modern societies. The world population is aging and projections indicate that, by 2025, the majority of elderly people will be living in developing countries. In Brazil, it has been estimated that there are now around 17.6 million people aged over 60 [5].

Epidemiological studies have shown that the prevalence of urinary incontinence, in both sexes, increases with advancing age [4]. The same result was found in the SABE Study (16.5% among elderly people between 60 and 74 years old and 33.3% among those aged 75 and over).

The association between aging and micturitional symptoms, particularly irritative symptoms such as urgency and urge-incontinence, can partially be explained by ultrastructural alterations in the detrusor, such as the development of fibrosis (reduction of bladder capacity) and hypersensitivity to norepinephrine (development of involuntary detrusor contractions) [6].

Among men, the urinary incontinence prevalence rate found in the SABE Study (11.8%) was lower than in other studies. Diokno et al. [7] found a prevalence of 18.9%. This difference may partially be explained by the different definitions adopted for urinary incontinence, or even by the different methodologies used. On the other hand, the prevalence rate among women was 26.2%, i.e. very similar to the findings of Irwin et al. [8] (27.5%), who used the urinary incontinence definition proposed by the International Continence Society.

Women present greater risk of developing urinary incontinence than do men. The reasons cited in the literature are the differences in urethral length, anatomy of the pelvic floor, effect of gestation and birth on the continence mechanisms and hormonal changes. Furthermore, many women erroneously consider urinary incontinence to be a normal part of aging itself. Moreover, a large proportion of urinary incontinence complaints are related to physical effort (stress urinary incontinence), which contributes towards the differences in prevalence rates between the sexes [9].

Another important factor is the self-reported health status and its association with urinary incontinence. It was observed that the worse the self-reported health status and the higher the age group, the greater the urinary incontinence prevalence. Because of the stigma attached to urinary incontinence, it interferes with health perceptions among those who have this condition. The data from the SABE Study showed that when patients aged 75 years and over declared that their health was good, the prevalence of urinary incontinence was 22.5%, whereas it went up to 41.5% among those who declared that their health was regular or poor (Table 1). Engström et al. [10] correlated urinary incontinence and other symptoms of the lower urinary tract with low self-reported health scores among men. The greater the number of symptoms present, the worse the self-reported health status.

A factor known to be frequently associated with urinary incontinence is the presence of incapacity or difficulty in functional performance. People with general mobility difficulties tend to present greater prevalence of urinary incontinence, which may worsen with aging. According to the results from the SABE Study, elderly people aged 75 and over who had general mobility limitations presented a urinary incontinence prevalence rate of 60.4%, and when they also had difficulty in going to the bathroom, this rate rose to 73.1% (Table 1). These findings are in agreement with the international literature. van Houten et al. [11] demonstrated that it was possible to reduce the prevalence of urinary incontinence among elderly women who had difficulties in functional performance but had good cognition, simply through training and improving their mobility and teaching them how to use the toilet.

There is great interest in identifying independent risk factors that are associated with urinary incontinence. This has resulted from better perception of this condition and from the enormous impact that it has on quality of life. Up to the present time, there have not been any data published on risk factors for urinary incontinence among elderly Brazilian patients.

The literature considers that female sex is a constitutional or predisposing risk factor for urinary incontinence. Irwin et al. [8] confirmed that lower urinary tract symptoms such as frequency, urgency, urinary incontinence and nocturia are very prevalent in both sexes, but greater among women, and that these symptoms increase with age. In the present study, it was observed that being a woman increased the chance of urinary incontinence by a factor of 2.35. Furthermore, being 75 years old or more increased the chance of urinary incontinence by a factor of 2.42 (Table 2).

Urinary incontinence and depression are common and distressing conditions that disproportionately affect women. Goldacre et al. [12] found that, for all the age groups studied, depression was more common among women with than those without urinary incontinence and therefore depression might be a consequence of urinary incontinence. Although urinary incontinence may cause depression, another hypothesis is that these two conditions might have the same biological basis. Neuropharmacological

Table 2

Final model from univariate and multivariate analysis for the presence of urinary incontinence, according to sociodemographic, clinical and functional characteristics of the elderly people in the municipality of São Paulo, Brazil, 2000.

Characteristics	Urinary incontinence				
	OR *	SD	p-value	Confidence interval	
				Lower limit	Upper limit
Sex					
Female	2.42	0.43	0.0000	1.70	3.43
Age					
75 years and over	2.35	0.33	0.0000	1.78	3.10
Presence of self-reported diseases/conditions					
Depression	2.49	0.43	0.0000	1.77	3.50
Stroke	1.69	0.45	0.049	1.01	2.85
Obesity	1.63	0.27	0.003	1.17	2.26
Diabetes mellitus	1.56	0.29	0.019	1.08	2.25
Functional status					
Difficulty in doing basic activities of daily living	2.01	0.35	0.0000	1.44	2.83

* Adjusted OR (95% confidence interval) = odds ratio (95% confidence interval) adjusted using the logistic regression method, one by one for all variables and in the final model only for the significant variables.

evidence from experimental studies indicates that some forms of depression are related to diminished serotoninergic function and may lead to hyperactive bladder symptoms. In the present study, it was observed that having moderate or severe depression increased the chance of presenting urinary incontinence by a factor of 2.49 for both sexes.

Neurological diseases such as stroke have been considered to be potential risk factors for urinary incontinence, and more precisely for urge incontinence. Jorgensen et al. [13] showed that the prevalence of urinary incontinence among long-term stroke survivors is high, especially among individuals who present paresis, depressive symptoms and diminished cognition. Patel et al. [14] demonstrated that urinary incontinence was an independent predictive factor for worsening of physical activity and quality of life among long-term stroke survivors. In the SABE Study, self-reported stroke increased the chance of urinary incontinence occurrence by a factor of 1.69 times.

Obesity has consistently been considered to be an independent risk factor for the presence and severity of urinary incontinence among elderly women. Subak et al. [15] showed that weight reduction is an effective treatment for overweight and obese women. Weight reduction by 5% to 10% has efficacy similar to other non-surgical

treatments and can be considered to be a first-line treatment for urinary incontinence. Obesity is also considered to be a factor that promotes urinary incontinence, and the likely cause for this association may be the increased intra-abdominal and bladder pressure that occurs with increased BMI. This increased pressure may create difficulties in the mechanism for urethral continence through diminishing the pressure gradient between the urethra and the bladder, thereby precipitating or exacerbating urinary incontinence, although hyperactive bladder has also been cited more frequently among obese women [16]. In the present study, in comparison with normal BMI, being obese increased the chance of urinary incontinence occurrence by a factor of 1.63.

Diabetes mellitus and urinary incontinence are chronic conditions that affect millions of people [17]. These two conditions frequently coexist in the same person, giving rise to great economic and social costs, as well as negatively affecting quality of life. Kebapci et al. [18] observed that diabetic cystopathy was the most frequent finding among patients with urinary incontinence, and that it could become established eight or nine years after the initial diagnosis of type 2 diabetes. These authors also demonstrated that the factors predicting the development of diabetic cystopathy were aging, duration of diabetes, retinopathy and microalbuminuria. In the present study, hav-

ing diabetes increased the risk of urinary incontinence occurrence by a factor of 1.56.

There is still discussion about whether urinary incontinence is a direct consequence of the elderly individual's difficulty in performing the basic activities of daily living, such as going to the bathroom, getting dressed and undressed, having a bath, etc. These difficulties may be consequences of the general frailty of elderly people or, furthermore, sequelae of underlying diseases such as neurological diseases. The concept of "dependent continence" denotes a condition in which the elderly person is continent, but only as a result of being regularly reminded to urinate or of having physical assistance for moving to the bathroom [19]. In an observational study among women aged over 65 who complained of urinary incontinence, Huang et al. [20] observed that declining cognitive and physical function were probably important contributory factors for urinary incontinence. The results from the SABE Study showed that having difficulties in basic activities of daily living increased the chance of presenting urinary incontinence by a factor of 2.01.

Knowledge of the risk factors makes it possible to develop prevention strategies and care policies that are more adequate, so as to allow greater age to be reached with better quality of life.

Conclusion

Urinary incontinence is a very prevalent symptom among the elderly population of the municipality of São Paulo, especially among women. Diseases like depression, stroke and diabetes mellitus and also conditions like obesity and functional limitations significantly increase the chance that urinary incontinence may occur. In association with other factors described above, the health status and quality of life among elderly people may become even worse, thereby becoming a public health question. Thus, adoption of preventive measures, early diagnosis and adequate treatment may minimize the negative consequences of urinary incontinence.

Resumo

Investigar a prevalência de incontinência urinária entre idosos de São Paulo, Brasil, e fatores associados e de risco. A Organização Pan-Americana da Saúde e a Organização Mundial da Saúde coordenaram estudo multicêntrico denominado Saúde, Bem-Estar e Envelhecimento *(Estudo SABE) em pessoas idosas (60 anos ou mais) que vivem em sete países da América Latina e Caribe. No Brasil, o estudo populacional foi realizado no Município de São Paulo no ano 2000. A amostra total brasileira foi de 2.143 pessoas. A prevalência da incontinência urinária auto-referida foi de 11,8% entre homens e 26,2% entre mulheres. Verificou-se que entre aqueles que relataram incontinência urinária, 37% também relataram acidente vascular cerebral e 34%, depressão. Observou-se que quanto maior a dependência do idoso, maior era a prevalência de incontinência urinária. Os fatores associados encontrados foram depressão (OR = 2,49), sexo feminino (2,42), idade avançada (2,35), limitação funcional (2,01). Incontinência urinária é um sintoma altamente prevalente entre a população idosa do Município de São Paulo, especialmente entre as mulheres. A adoção de medidas preventivas pode reduzir os efeitos negativos da incontinência urinária.*

Incontinência Urinária; Fatores de Risco; Idoso

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