

## Prevalence and Risk Factors for Urinary and Fecal Incontinence in Brazilian Women

Joao L. Amaro, Carlos A. Macharelli, Hamilto Yamamoto, Paulo R. Kawano, Carlos R. Padovani, Aparecido D. Agostinho

*Department of Urology (JLA, HY, PRK, ADA), Department of Public Health (CAM), and Department of Statistics (CRP), School of Medicine, UNESP, Botucatu, Brazil*

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### ABSTRACT

*Objective:* To evaluate prevalence and risk factors of fecal and urinary incontinence (UI) in Brazilian women.

*Materials and Methods:* 685 women older than 20 years of age answered a questionnaire about urinary and fecal symptoms, clinical and obstetric antecedents. They were grouped according to presence or absence of UI.

*Results:* Urinary and fecal incontinence was reported in 27% and 2% of cases, respectively. Mean age of incontinent women was significantly higher than continent ones. Incontinent women had a mean number of micturitions significantly higher than the continent ones. On average, incontinent women had higher rate of pregnancies and vaginal delivery when compared to the continent ones. Body mass index (BMI) was significantly higher in incontinent participants and in women with no UI complaints (27.35 vs. 24.95,  $p < 0.05$ ). Fecal incontinence prevalence was 2% and occurred exclusively in patients with UI.

*Conclusions:* Vaginal delivery and high BMI have been identified as risk factors for UI development while aging and number of pregnancies may be correlated factors.

*Key words:* urinary incontinence; fecal incontinence; female; prevalence

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### INTRODUCTION

The study of prevalence and risk factors of urinary and fecal incontinence in women is very important to establish preventive strategies. There are different epidemiological studies showing wide variability in the results, probably related to the lack of uniform methodological criteria to evaluate urinary incontinence (UI).

UI is a worldwide public health problem that affects thousands of women, and causes serious socio-economic impact. It can also influence quality of life (1,2) or lead to isolation and depression (3).

Aging, menopause, pregnancy and delivery (2) as well as obesity (5,6) are considered important risk factors to develop stress urinary incontinence (SUI).

Fecal incontinence (FI) is characterized by liquid or solid feces loss, and can originate from neuromuscular lesions of the pelvic floor muscle. A recent study showed a 19.7% incidence in women with gynecological problems (7).

The prevalence of fecal and urinary incontinence in women has been studied around the world. However, there are few reported studies regarding developed countries, with a variation between 29 and 75% in the incidence of SUI (8).

To our knowledge no study showing UI prevalence in Brazilian women has to date been reported. However, Guarisi et al. observed SUI prevalence in 35% of cases in a population of exclusively climacteric women (9).

Therefore, there are few reported studies, in Brazil, with an appropriate design to detect this pathology. This study aimed to determine fecal and UI prevalence and risk factors to develop UI in women who lived in Botucatu, an averaged-size Brazilian town, whose population represents a Brazilian ethnic composition.

## MATERIALS AND METHODS

The study evaluated 685 women older than 20 years-old living in Botucatu. For the sample calculation, the data bank of SEADE Foundation (10) was used to obtain the number of those women who were within the age limit proposed in the study. A stratified simple random sampling of 685 women, representative and proportional to the studied age limit, was obtained out of 34,066 women.

All women, randomly selected, answered a clinical evaluation questionnaire. All participants were visited and informed about the research, and, if they agreed to participate, they signed the free informed consent approved by the Ethical Research Board of the Botucatu Medical School. This questionnaire was previously tested (11) and used for question evaluation, the verification and women's acceptance, as well as for interviewer training.

The selected women participated in two different phases, firstly they were previously sent a sealed envelope and a clinical questionnaire by mail that had to be completed and sent back to the researchers. In the second phase, 30 days later, all selected women were interviewed in their homes by previously trained interviewers. No patient refused to answer the questionnaire, which was divided into three different parts: 1- Identification; 2- Specific evaluation of symptoms such as the relationship between strength, urinary and fecal loss, circumstances of urine loss, obstetric history, problems regarding urine storage and surgical history; 3- Psycho-social effects of disease.

Body mass index (BMI), obtained through the questionnaire, was calculated and classified according to Garrow et al. (12).

Any urine loss was considered urinary incontinence, and fecal loss was considered any loss, either solid or liquid, in the previous year. Urinary incontinence intensity was evaluated considering the circumstances of loss, that is, mild at extreme stress (cough, carrying weight), moderate at medium stress (running, going up and down stairs) and severe at minimum stress (walking, change in a lying position).

The women were divided into two groups according to the presence or absence of urine loss: group G1 (n = 500) with women without urine loss and group G2 (n = 185) with urine loss.

Considering the quantitative variables of groups (age, micturition number, pregnancies and BMI), the Student's t-test was used for independent samples (13). As for group associations with qualitative variables (categorized), the Goodman test was used for contrasts in the multinomial population (14). The multivariable logistic regression analysis of urinary incontinence was performed as regards variables: vaginal delivery, aging, number of pregnancy and BMI (15). Differences were considered significant when the p value was < 0.05.

## RESULTS

The clinical evaluation questionnaire was answered and sent back to the researcher in 18% (121/685) of cases, which prevented the comparative analysis with the individuals interviewed at home.

UI prevalence was 27%, and 15% of the incontinent women had urine loss at minimum stress; urgency was associated with 58% of cases. Among the women with UI, 36% reported the use of 2.7 pads per day, on average. Urine loss was related to childbirth in 30% of cases (56/185), to pregnancy in 9% (16/185) and without apparent cause in 61% (113/185).

Mean age was significantly higher in G2 than in the continent group (Table-1). UI prevalence increased with aging (Figure-1).

The average number of micturitions per 24 hours was significantly higher in the inconti-

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**Table 1** – Demographic characteristics of 685 subjects interviewed.

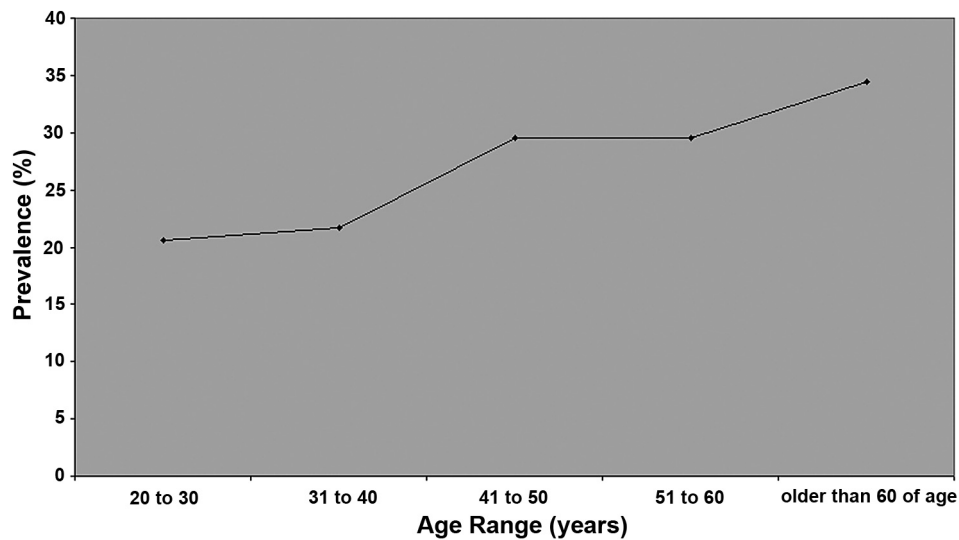
Variables	Group		Statistics
	Without Urinary Loss	With Urinary Loss	
Mean age (range)	45 (22-96)	51 (22-87)	4.53 (p< 0.05)
Body mass index (k/m <sup>2</sup> ) (range)	24.95 (14.1-45.9)	27.35 (18.8-56.1)	5.76 (p< 0.05)
Average number of micturitions per 24 hours (range)	5.2 (1-30)	7.0 (2-20)	5.07 (p < 0.05)
Percentage of nocturia	46.4%	77.3%	p< 0.05
Average number of pregnancies (range)	2.6 (0-14)	3.6 (0-19)	4.26 (p < 0.05)
Average vaginal deliveries (range)	2.9 (1-14)	3.5 (1-18)	1.99 (p < 0.05)
Percentage of cesarean deliveries	40%	29%	p < 0.05

continent women than in the continent ones (Table-1). Nocturia was significantly higher in incontinent women than in continent women (77% - vs. 46%), p < 0.05).

The number of pregnancies was, on average, significantly higher in women with UI when compared

to continent women (Table-1). Vaginal delivery was significantly higher in the incontinent group than in the continent group (76% vs. 54%, p < 0.05).

There was significantly higher predominance of cesarean section among the continent patients (Table-1).



**Figure 1** – Urinary incontinence prevalence in relation to age.

**Table 2** – Influence of delivery as a determinant factor of urinary incontinence.

Groups (N)	Delivery		Statistics
	Vaginal Delivery Alone	At least One Non Vaginal Delivery	
Continent (402)	152 (37.81%)	250 (62.19%)	5.31 (p < 0.05)
Incontinent (168)	81 (48.21%)	87 (51.79%)	

There were 80% (402/500) of women with at least one pregnancy in the continent group, and 91% (168/185) in the incontinent group (Table-2).

BMI was on average significantly higher in the group with urinary loss as regards the continent women (Table-1).

In the incontinent group, 70% of women reported discomfort and 1.2% sought medical care due to urine loss. Among the incontinent group, there were social consequences for 4.8%, 3.6% reported isolation of friends and 1.2% of the family.

In 2% of cases, UI was associated with fecal incontinence, no fecal loss was observed in continent women.

The multivariable logistic regression analysis of vaginal delivery and BMI showed that they are risk factors of urinary incontinence and no statistical difference was observed regarding aging and the number of pregnancies (Table-3).

**COMMENTS**

UI prevalence was observed in 27% of women ranging from 20 to 59 years of age and 60 years or older who lived in the town of Botucatu, SP. Other studies showed that UI prevalence varied from 4.6% to 46% depending on age and the methodology adopted (15-18). This shows wide discrepancies in world prevalence rates as well as the likely influence of different ethnicities (19). It would be inappropriate to extrapolate these data to our population since racial characteristics could influence UI rates. In Brazil, it is difficult to distinguish among different races due to the high miscegenation rate (20), regional studies could provide specific strategies for prophylaxis and adequate treatment of UI.

Higher incidence of mixed UI (58% of cases) was observed concerning stress urinary incontinence. This rate was corroborated by Nieto Blanco et al. (21). However, it is higher than the rate described in the Norwegian EPICONT study (22). These facts may be explained by the different sensitivity and specificity of the clinical questionnaire in diagnosing SUI, urgency UI and mixed UI or even by the characteristics and age of the women studied (23).

This study observed higher UI incidence regarding aging in the women studied. These aspects are found in other studies (11,24), showing a probable increase of risk factors in women’s aging.

In the incontinent group, a higher number of micturitions were found not only in 24 hours but also in nocturia; this fact can be related to higher incidence of urgency observed in this study when compared to the literature (22).

Despite controversy, some authors have reported higher SUI incidence in women who had vaginal delivery, suggesting a likely protective action of cesarean section in UI (3,18). This study observed significant higher incidence of vaginal delivery than cesarean in women with urinary loss; however, despite the probable protective role of cesarean section in UI development, maternal-fetal risk and better performance in post-partum UI prophylaxis must be considered before recommending this delivery procedure.

Considering BMI, there was a significant body weight increase regarding UI; this correlation was also observed by other authors (16).

The fact that UI is not a lethal disease and its minor social consequences (4.8%) may explain the very low percentage (1.2%) of patients who sought medical care, although 70% in our study reported discomfort.

Incontinent women presented 2% of fecal incontinence. Anal sphincter incompetence as well

**Table 3** – Model of logistic regression of urinary incontinence.

Variable	Coefficient ± SD	p Value	OR*	(CI ** 95%)
Constant	-4.2880 ± 0.5510	-	-	
Age	0.0106 ± 0.0063	p > 0.05	1.011	(0.998;1.023)
Vaginal delivery	0.7360 ± 0.2210	p < 0.05	2.087	(1.354;3.219)
Number of pregnancies	0.0284 ± 0.0383	p > 0.05	1.029	(0.954;1.109)
BMI	0.0848 ± 0.0188	p < 0.05	1.088	(1.049;1.129)

SD = standard deviation; \* odds ratio; \*\* confidence interval; BMI = body mass index.

as UI can be related to pelvic floor dysfunction (25), and both should be treated concomitantly by surgical or non-surgical treatment, improving the patients' quality of life.

In our patient population, the questionnaire sent by mail has not shown to be adequate for UI evaluation; however, other authors recommend their use to study UI prevalence in women (8).

**CONCLUSIONS**

UI and fecal incontinence prevalence in Brazilian adult women older than 20 years was 27% and 2%, respectively. Vaginal delivery and high BMI have been identified as risk factors for UI development while aging and number of pregnancies may be correlated factors. Mixed UI was the most prevalent followed by stress UI.

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**CONFLICT OF INTEREST**

None declared.

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**Correspondence address:**

Dr. João Luiz Amaro  
 Departamento de Urologia  
 Faculdade de Medicina de Botucatu  
 Botucatu, SP, 18618-970, Brasil  
 Telephone: + 55 14 3811-6271  
 E-mail: jamaro@fmb.unesp.br

## EDITORIAL COMMENT

This is an article regarding an interesting topic; the prevalence and the risk factors of urinary and fecal incontinence in Brazilian women, a population with specific racial characteristics. There are few data on this issue available in the literature. However, only with a multivariable logistic regression analysis,

in the presence of different variables statistically significant, it could be possible to understand the real impact of different risk factors. Moreover, there are many certain and uncertain obstetrics risk factors for urinary incontinence that should have been considered or commented.

**Dr. M. Serati**

*Department of Obstetrics & Gynecology  
University of Insubria  
Del Ponte Hospital  
Varese, Italy  
E-mail: mauserati@hotmail.com*

## EDITORIAL COMMENT

Dr. Amaro and colleagues performed a cross-sectional study in order to describe the rates of urinary and fecal incontinence in a Brazilian community. Through mailed questionnaires and home interviews, the authors found that 27% of respondents had urinary incontinence and only 2% had fecal incontinence. In contrast, Fritel and colleagues found a fecal incontinence rate of 9.5% in a cohort of French women (1). Although discrepancies on rates of incontinence between the studies may be related to research design, we must not forget that some studies have suggested that cesarean delivery is protective against pelvic floor damage. Indeed, the rates of cesarean section are less than 20% of all deliveries in France compared to approximately 50% of deliveries in Brazil (2). Furthermore, the authors found that vaginal delivery was associated with increased odds of urinary incon-

tinence and that fecal incontinence was only reported in women who also had urinary incontinence. Finally, the authors note that only 1.2% of respondents with incontinence sought medical care. Further research is needed to identify barriers to care so that steps may be taken to resolve obstacles to continence.

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**Dr. Kyle J. Wohlrab**

*Division of Urogynecology and  
Female Pelvic Reconstructive Surgery  
Women & Infants' Hospital  
Alpert Medical School at Brown University  
Providence, Rhode Island, USA  
E-mail: kwohlrab@wihri.org*