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Prevalence of urinary symptoms and associated obstetric factors in adult women

Prevalência de sintomas urinários e fatores obstétricos associados em mulheres adultas

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Abstract

Background: Urinary incontinence is a disease with high prevalence among the female population and it has important physical, mental and social repercussions. **Objective:** To investigate the prevalence of urinary incontinence symptoms and the relationship of these symptoms with obstetric factors. **Methods:** This was an analytical cross-sectional study in which 194 adult women employed at the Universidade do Vale do Paraíba were investigated. They answered questions from the King's Health Questionnaire. Urinary symptoms were linked to the obstetric history and analyzed by unpaired *t* test and by the Fisher exact test. **Results:** The prevalence of urinary symptoms was 54.3%. Stress urinary incontinence was the most frequent symptom (55.7%), followed by nocturia (27.8%), urgency (24.1%), pollakiuria (16.7%) and nocturnal enuresis (10.2%). The women who had been pregnant at least once were 1.75 times more likely to develop these symptoms than nulliparae, and the difference was significant when compared with women who had two or more pregnancies (p=0.009). Two or more deliveries increase the risk 1.57 times, regardless of the method of delivery (p=0.019). **Conclusions**: The prevalence of urinary symptoms was high. They were associated with obstetric factors and became proportionally greater with increasing numbers of pregnancies and deliveries.

Key words: prevalence; urinary incontinence; adult; risk factors.

Resumo

Contextualização: A incontinência urinária é doença com alta prevalência na população feminina e possui destacadas repercussões físicas, mentais e sociais. **Objetivo:** Investigar a prevalência de sintomas urinários característicos de incontinência urinária associado aos fatores obstétricos. **Métodos:** Estudo analítico transversal em que foram investigadas 194 mulheres adultas, funcionárias da Universidade do Vale do Paraíba, que responderam questões do King's Health Questionnaire. Os sintomas urinários foram relacionados à história obstétrica e analisados pelo teste *t* de *Student* não-pareado e pelo teste exato de Fisher. **Resultados:** A prevalência de sintomas urinários foi de 54,3%, sendo maior para incontinência urinária por esforço (55,7%), seguida por nictúria (27,8%), urgência (24,1%), polaciúria (16,7%) e enurese noturna (10,2%). Mulheres que engravidaram pelo menos uma vez tiveram 1,75 vezes mais chance de desenvolver os sintomas comparadas as nulíparas, sendo significativo para duas gestações ou mais (p=0,009). Dois partos ou mais aumentaram o risco em 1,57 vezes, independente da via (p=0,019). **Conclusões:** A prevalência de sintomas urinários foi alta e estes estão associados a fatores obstétricos, mostrando-se proporcionalmente maior de acordo com o número de gestações e partos.

Palavras-chave: prevalência; incontinência urinária; adulto; fatores de risco.

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Introduction

Urinary incontinence (UI) can restrict the social, family, professional, and sexual activities of women and lower their quality of life by generating social isolation and emotional stress, often combined with a feeling of inferiority and depression[1]. In addition to these physical and social consequences, there is also a financial burden, which is substantial and growing. In the United States, the direct annual costs related to UI exceed US$ 19.5 billion, with a total productivity loss estimated at US$ 553 million, out of which US$ 393 million correspond to women with UI, and US$ 159 million to men with the same condition[2]. The authors concluded that UI is very costly, generating annual expenses similar to those associated with other chronic dysfunctions in women.

Thus, the urinary symptoms which negatively affect the lives of many women have their prevalence estimated with great variability[3,4], resulting in a public health issue. Although the clinical status and the prognosis seem to worsen with age, young adult women are not exempt from the presence of urinary symptoms.

In Brazil, there are few studies on the prevalence of UI, and it is usually investigated in regards to stress in middle-aged women. In the study of Mendonça et al.[5], the results showed that out of 410 women attended at Hospital Júlia Kubitschek, in Belo Horizonte, Minas Gerais, the prevalence of the stress of urinary incontinence (SUI) varied from 12.6 to 48%, and the highest incidence affected women between 41 and 50 years of age. In another study by Guarisi et al.[6], a household survey conducted in the city of Campinas, São Paulo, found that out of the 456 women aged 45 to 60, 35% had complaints concerning stress UI.

Symptom reports are often used in epidemiological investigations to determine incontinence type[3]. The complaints about urgency and pollakiuria, as well as nocturnia and urge-incontinence (the latter being present or not) were found in women with a hyperactive bladder[7]. A study that looked into the prevalence and the impact of the symptoms of the lower urinary tract in 2,000 women revealed that some level of UI was reported by 69% of the interviewees[8].

Several risk factors are associated with UI in the literature, although some have been questioned. This suggests that UI is part of a complex problem. It may be multifactorial given the changes to the vascular and central nervous systems which interfere with the mechanisms of bladder control with age[9].

Risk factors that are commonly described and associated with the development of UI are: vaginal delivery, in which the passing of the fetus can damage muscles and innervations; traumatic deliveries with the use of forceps and/or episiotomy; multiparity and pregnancy at an advanced age; obesity; ethnicity; diabetes; urinary infections, and menopause[10-14].

Thus the literature shows that UI affects several stages of women's lives, occurs with a high prevalence and cost, and can be regarded as a public health issue. Therefore, it is imperative to investigate the prevalence of the distinct urinary symptoms of UI associated with obstetric factors in adult women.

Methods

Using a cross-sectional analytical design, we examined a population of 452 people employed at Universidade do Vale do Paraíba (Univap) during the first term of 2004. The personnel department was asked to provide a list containing the allocation number of the women employed at the Institution during that period. After the research project was approved, all women were contacted.

The dependent variables were the urinary symptoms characteristic of the various types of UI, and the independent variable was the obstetric history. The questionnaire consisted of the information on obstetric profile (number of pregnancies, number of deliveries, birthing method, episiotomy, forceps) and urinary symptoms (pollakiuria, nocturia, urgency, urge-incontinence, SUI, nocturnal enuresis, climacturia, pain and difficulty urinating) of the structured King's Health Questionnaire, pre-tested, translated, and validated to Portuguese by Tamanini et al.[14]. The questionnaire evaluates the presence or absence of urinary loss complaints, the seriousness of the problem and to what extent it affects the person and limits daily activities and sleep.

The presence of one or more of the following answers was considered a typical urinary symptom of UI in the studied population: "high" for pollakiuria; "moderate" and "high" for nocturia, urgency, urge-incontinence, urinary tract infection, pain, and difficulty urinating; and "low", "moderate", and "high" for the SUI, nocturnal enuresis and climacturia. Therefore, two distinct situations were identified in the collected data: presence or absence of the symptoms shown by the classification above. The analysis was based on these two conditions.

In this study, pollakiuria, nocturia, urgency, urge-incontinence, SUI, and climacturia were considered urinary storage symptoms; voiding symptoms included nocturnal enuresis, pain and difficulty urinating. Recurrent urinary tract infection, however, was considered a frequent and characteristic symptom of women with UI.

The data were analyzed after the preparation of a spreadsheet to codify each variable. The frequencies of the absolute

and relative values of the studied population were calculated for the obstetric history and for the urinary symptoms. The associations were carried out between the variables through the analysis of non-paired means by the *t* test for: total number of pregnancies and deliveries, number of normal deliveries and of cesarean sections. The analysis of independence through the Fisher exact test was used for the following variables: total of pregnancies and deliveries, type of delivery, number of normal deliveries and of cesarean sections, use of forceps and of episiotomy in normal delivery. The prevalence ratio test was applied to pregnancies, total number of pregnancies and deliveries, and to the presence of urinary symptoms. For all the statistical tests, the confidence interval (CI) was 95%, and the representativeness of the number of women analyzed was calculated through the estimated sampling error.

This research was approved by the Research Ethics Committee of Univap, under protocol number L002/2004/CEP, according to the National Health Board Resolution 196/96 of March 8th 2004, and the participants signed a consent form.

Results

The population of employees of the educational institution consisted of 452 workers hired during the first term of 2004. Of those, four (0.9%) were no longer employed, six (1.3%) were on maternity leave, 34 (7.5%) did not agree to take part in the study, five (1.1%) did not fill in the questionnaire and returned it, 209 (46.2%) did not return it, and 194 (42.9%) agreed to take part in the study. The sampling error was 4.7%.

Of the 194 women analyzed, 107 (55.2%) were administrative workers, 86 (44.3%) were lecturers at the university, and one (0.5%) did not specify her position. All women had at least a high school diploma, 40.7% had a postgraduate degree, and 34.5% graduated from college.

The mean age of the studied population was 39.9±11.1 years. Concerning the obstetric issues, 65.5% of the women had been pregnant at least once. The most frequent numbers were two pregnancies (in 41 women, 32.2%), and one pregnancy (in 39 women, 30.7%). As to the number of deliveries, the following data were found: 47 women had delivered only once (37.9%); 43, twice (34.7%), and 25, three times (20.2%). From those who had delivered, 59.7% only had cesarean sections, 33.1% had vaginal delivery, and 7.2% had both methods. With regard to vaginal deliveries, 68% were done only with episiotomy; 22% were natural deliveries, without forceps or episiotomy, and 10% with forceps and episiotomy.

One or more urinary symptoms were reported by 54.3%, four times as much as the percentage of participants who reported an isolated episode of urine loss under any circumstances (13.5%) (p=0.001). Among the symptoms, SUI was the most frequent (58.3%), followed by nocturia (27.8%), urgency (24.1%), pollakiuria (16.7%), nocturnal enuresis (10.2%), and urge-incontinence (4.2%).

For the symptomatic, as well as for the asymptomatic women, the mean of total pregnancies was 1.9 and one pregnancy per woman, respectively (p=0.005). Parity was also statistically significant in the analysis of the non-paired means (p=0.003); however, the means of the types of parity were not significant in the sample (Table 1).

Among the women who had been pregnant three times or more, the number of pregnancies of the symptomatic women was statistically different from that of the asymptomatic women (p=0.001). Hence, three or more pregnancies might be a factor associated with urinary symptoms in the analyzed women. The same relationship can be considered for the total of deliveries in which the parity greater than or equal to three deliveries was significant for the presence of urinary symptoms (p=0.001). With regard to the types of delivery, there was no significant relationship between the total number of cesarean sections and normal deliveries, with or without the use of the forceps and/or episiotomy (Table 2).

The prevalence ratio test for the obstetric history showed that the women who had been pregnant were 1.75 times more likely to develop some form of UI than those who had never been pregnant (p=0.001). Among the women who had been pregnant, that figure was significant for two or more pregnancies (p=0.009), and those who delivered two times or more were 1.57 times more likely to develop UI (p=0.009), regardless of the method of delivery (Table 3).

Table 1. Analysis of unpaired *t* test means of the total of pregnancies, total of deliveries, number of vaginal deliveries, cesarean sections with and without the presence of urinary symptoms of the studied women.

Variables	Urinary symptoms			
	Yes		No	
	Mean (SD)	CI 95%	Mean (SD)	CI 95%
Total pregnancies	1.9 (1.58)*	1.6-1.2	1 (1.23)	0.7-1.3
Total deliveries	1.6 (1.4)**	1.4-1.9	0.9 (1.04)	0.6-1.1
Number of vaginal deliveries	2.4 (1.25)	2-2.9	1.7 (1.2)	1-2.4
Number of cesarean sections	1.8 (0.84)	1.5-2	1.6 (0.62)	1.3-1.8

*p=0.005;**p=0.000.

Table 2. Analysis of independence of obstetric history and the presence or absence of symptoms in the studied women by the Fisher exact test.

Variables		Symptom		p value
		Yes % (n)	No % (n)	
Total pregnancies	Zero to two	66.7 (72)	87.2 (75)	0.001*
	Three or more	33.3 (36)	12.8 (11)	
Total deliveries	Zero to two	74.1 (80)	93 (80)	0.001*
	Three or more	25.9 (28)	7 (6)	
Type of delivery	Normal	36.3 (29)	27.3 (12)	0.384
	Cesarean	55 (44)	68.2 (30)	
	Normal and cesarean	8.8 (7)	4.5 (2)	
Number of vaginal deliveries	One or two	55.6 (20)	78.6 (11)	0.197
	Three or more	44.4 (16)	21.4 (3)	
Number of cesarean sections	One or two	78.4 (40)	93.8 (30)	0.071
	Three or more	21.6 (11)	6.3 (2)	
Use of forceps during vaginal delivery	Yes	13.9 (5)	7.1 (1)	0.663
	No	86.1 (31)	92.9 (13)	
Use of episiotomy during vaginal delivery	Yes	80.6 (29)	78.6 (11)	1.000
	No	19.4 (7)	21.4 (3)	

*statistically and significantly different from lower percentages.

Table 3. Prevalence and prevalence ratio of variables: pregnancies, total number of pregnancies, total number of deliveries according to urinary symptom report.

Independent variable		Urinary symptoms		Confidence interval (with level of 95%)	p value
		Prevalence (in 1,000 people)	Prevalence ratio		
Pregnancies	No	373.1	reference		
	Yes	635.5	1.75	1.25-2.45	0.000*
Total number of pregnancies	Zero	373.1	reference		
	One	538.5	1.44	0.94-2.21	0.099*
	Two	634.1	1.70	1.15-2.50	0.009*
	Three	708.3	1.90	1.27-2.84	0.005*
	Four or more	826.1	2.21	1.54-3.18	0.000*
Total number of deliveries	Zero	400.0	reference		
	One	531.9	1.33	0.90-1.97	0.162
	Two	627.9	1.57	1.09-2.27	0.019*
	Three	708.3	2.00	1.41-2.83	0.001*
	Four or more	826.1	2.22	1.54-3.21	0.006*

*statistically significant values with p≤0.05.

Discussion

The literature shows that urinary symptoms are common among women, and the prevalence is high and estimated with great variability (25 to 69% according to the age group, population, type of incontinence, and type of study). Young adult women are not exempt from the presence of urinary symptoms, although the clinical status and prognosis seem to worsen with age[3-5,15-23]. Conversely, there are studies that did not find any relationship between the risk of UI and age, although its high prevalence was also taken into account[6,24]. In the present study, the prevalence of urinary symptoms was high, and the SUI the most frequent symptom. Other studies confirmed the same symptoms, and found that SUI was the most prevalent among adult women[8,25].

There is evidence that the main etiology of UI is one or more vaginal deliveries, with an increased risk for multiparous women, and that other factors, such as the use of forceps and vacuum extraction, are not associated with the problem[4,10,26]. A possible explanation for this is the fact that, during vaginal delivery, there is unnoticeable distension or rupture of muscles, ligaments, and nerves responsible for bladder control[27]. However, SUI cases are more likely to have persistent symptoms after forceps deliveries than after spontaneous deliveries or vacuum extractions. This suggests that, although the lesion mechanism is still unclear, it is probably related

to the compression of the pudendal nerve, which is likely to cause changes in its innervation and consequent evolution into a neuropathy, and eventually into the denervation of the urinary sphincter[28].

Peeker and Peeker[29] claim that pregnancy itself involves the risk of developing UI, a risk that increases when associated with vaginal delivery and multiparity. The authors also found that after vaginal delivery, the prevalence of UI increases from 30 to 50%. In deliveries by elective caesarian, or even in those carried out during the delivery, the probability of developing UI was significantly reduced. Nonetheless, this data is only applicable to women who underwent one or two cesarean sections, as the increase in parity was considered a risk factor for UI, particularly after four children. The change in the terminal motor of the pudendal nerve from pregnancy to delivery was similar in vaginal delivery as well as cesarean section.

In the present study, for both factors, namely pregnancy and parity, the higher their number, the greater the prevalence of UI, regardless of the type of delivery, which did not show factors associated with urinary symptoms. It follows that women could not prevent the problem by having a caesarian section exclusively, because pregnancy seems to be as relevant as the number of deliveries in determining permanent UI in the post-reproductive years[30]. The protection of the pelvic floor and therefore the reduction in the UI prevalence are often mentioned as benefits originating from elective caesarian section, but the relationship between pregnancy or type of delivery and UI incidence has not been fully explained[30].

Overall, this study points out the need to trace urinary symptoms and associated factors so that they can be detected as early as possible by the health professionals. These professionals must also be aware of the high incidence of this condition among women, which will make it possible to adopt a preventive approach.

Thus, the data shown lead us to conclude that young women are not exempt from the presence of the several UI symptoms, given that more than half of the women studied had one or more urinary symptom. Of the analyzed symptoms, the most prevalent was the SUI. In every type of analysis, pregnancy and delivery were factors associated with the urinary symptoms, regardless of the method of delivery, and that was in direct proportion to the increase in the number of pregnancies and deliveries in the studied population. Therefore, there is a need for more studies using validated and specific instruments in order to investigate, classify and quantify urinary symptoms in populations without UI diagnosis.

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