



JRHS

Journal of Research in Health Sciences

journal homepage: www.umsha.ac.ir/jrhs



Original Article

Prevalence and Risk Factors of Urinary Incontinence in Women Residing in a Tribal Area in Maharashtra, India

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ARTICLE INFORMATION

Article history:

Received: 01 April 2013

Revised: 11 July 2013

Accepted: 15 August 2013

Available online: 27 August 2013

Keywords:

Urinary Incontinence

Tribal

Prevalence

India

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ABSTRACT

Background: To study the prevalence and risk factors of urinary incontinence in tribal women and to assess the treatment seeking behavior of affected women.

Methods: A cross-sectional descriptive study was conducted in Khardi, a tribal village, selected by random sampling, in Thane district, Maharashtra, India during the period October 2010 to January 2011. All women aged 20 years and above were selected for the study except pregnant and lactating women and those with neurological disorders affecting bladder continence. A semi-structured questionnaire assessing socio-demographic factors of women, severity, type of incontinence, obstetric and other risk factors of incontinence was administered to the study participants. The participants who suffered from incontinence were inquired regarding their treatment seeking behavior for the same. Logistic regression analysis was used to determine the independent association between these factors and primary outcome of incontinence.

Results: Of 353 women participated in the study, 90 (25.5%) reported urinary incontinence. Prevalence of urinary incontinence showed significant association with increasing age ($P < 0.010$). Associated obstetric factors included high parity ($P < 0.001$), early post-partum resumption of heavy work ($P < 0.050$) and prolonged labor ($P < 0.010$). Other risk factors like hypertension, diabetes, chronic cough and constipation were predictors of incontinence in regression analysis ($R^2 = 0.47$). Healthcare seeking rate was only 14.4% since they either accepted incontinence as a normal ageing process or were embarrassed to seek medical advice.

Conclusions: Urinary incontinence is a neglected problem in tribal women predicted by obstetric and other risk factors.

Citation: Prabhu SA, Shanbhag S. Prevalence and Risk Factors of Urinary Incontinence in Women Residing in a Tribal Area in Maharashtra, India. J Res Health Sci. 2013;13(2):125-130.

Introduction

Urinary incontinence (UI) is defined by the International Continence Society as “the complaint of any involuntary loss of urine and which is a social or hygienic problem”¹. Urinary incontinence (UI) and associated lower urinary tract symptoms are widespread and troubling conditions affecting 11-57.0% of the adult women worldwide and it can severely compromise their social life². The inability to control urine is quite an unpleasant and distressing problem. Though it does not lead to death, it causes substantial morbidity, social seclusion and psychological stress. Many women are too embarrassed to talk about it and some believe it to be untreatable even in the western countries³.

Most studies on this topic have been carried out in developed countries and affluent study populations. Scarce data exists on its prevalence in India, in minority women or in those of lower socio-economic status. A working hypothesis is that the prevalence of UI may be high in such a population as it could be under-reported by patients. This may be due to lack of education, economic hardships or social stigma⁴. The condition is usually under reported as many women hesitate to seek help or report symptoms to medical practitioners due to the embarrassing and culturally sensitive nature of this condition⁵. Potential risk factors for UI include advancing age, high parity, vaginal deliveries, obesity, surgery, chronic constipation, and chronic respiratory problems⁶.

This study examined the prevalence of UI in tribal women, associated risk factors and the treatment seeking behavior of affected women. Economic hardships in tribal area and heavy physical work in farms make these women more vulnerable to UI; hence an attempt was made to study the condition in this group.

Methods

A cross-sectional study was conducted in Shahapur, a tribal block in Thane District, which is the field practice area for training of post graduate students of Community Medicine of a medical college and tertiary care hospital in Mumbai from October 2010 to January 2011. The block consists of 7 villages, all alike in the demographic, occupational and socio-economic factors. One village was selected by simple random sampling method (selected by considering the last digit of a randomly drawn note). This being a cross-sectional prevalence study, all women of this village eligible as per the inclusion criteria were included in the study.

This village comprising of 6 divisions with an Anganwadi* each has a Survey/Family Register specific to that division which includes detailed information of the families residing in that area (i.e. age, sex, marital status, education, parity, pregnant and lactating women and under five population). * (An Anganwadi is a government sponsored child-care and mother-care center in tribal and rural areas in India, one per division in a village and it maintains all health/survey records pertaining to that division of a village.) All women aged 20 years and above were selected for the study since potential risk factors associated with UI (i.e. causes of acquired incontinence) usually manifest themselves from the third decade of life. Pregnant and lactating women were excluded from the study to remove the confounding effects of physiological changes induced by pregnancy that may lead to transient/temporary incontinence, which resolves shortly after delivery. Women with acute urinary tract infection and neurological disorders where urinary bladder continence was affected were excluded from the study.

As per the Survey/Family register, about 442 women were eligible for the study. A list of all such eligible women was prepared from these survey registers and the local village health volunteer accompanied the investigator for locating their houses and building rapport for the interview. Forty-eight women had left the village with their families to work in distant brick-kilns and were not expected to return during the stipulated study period while 11 women did not consent. Institutional Ethics Committee approval for the study was acquired prior to start of study.

Altogether 353 women participated in the study and were administered a semi-structured questionnaire which consisted of four parts: (a) Age, occupation, obstetric history (b) incontinence, its types and severity (c) risk factors for incontinence and (d) treatment seeking behavior.

Pretesting and validation of the questionnaire were performed through a pilot study on 30 women (these were excluded from the main study). Women were interviewed in their house wherein the purpose of the study was explained, and informed consent sought and repeat visit was made to those houses which were locked at the initial visit. Privacy and confidentiality were ensured during the whole process.

Operational definitions for UI, stress, urge, and mixed incontinence were based on those provided by International Continence Society.¹ A woman was considered to have stress incontinence if a positive response was elicited to the question "Do you have episodes of involuntary leakage of urine on exertion or on sneezing/coughing/laughing or lifting heavy weights?", and Urge incontinence if the question "Do you have episodes of involuntary leakage accompanied by or immediately preceded by urgency?" provided a positive response. If a positive response was obtained for both questions, she was classified as a case of mixed incontinence.^{6,7}

The risk factors evaluated for UI were parity, history of prolonged labor, heavy work in farms, early post-partum resumption of heavy work in farms, duration since menopause and history of hysterectomy or any other pelvic surgery in past. If 12 or more hours (i.e. half a day or more) had elapsed during labor after active pains began till the baby was delivered, the woman was considered to have had a prolonged labor. Women who worked in farms as laborers performing heavy work were assessed for the duration within which they resumed work post-partum. Early post-partum resumption of heavy work in farms (<1 month) was considered as a risk factor for incontinence. History of chronic cough was obtained and if cough was present for more than 3 days per week for more than three months, then it was considered as chronic cough. Women were also assessed for presence of chronic constipation, hypertension, diabetes and addictions. Body mass index (BMI) of the study participants was assessed and was classified in four categories namely Underweight (BMI<18), Normal (BMI=18-24.99), Preobese (BMI=25-29.99) and Obese (BMI>30). The above-mentioned factors were evaluated as predictors for outcome of UI.

Data analysis was done using SPSS software, version 18. The statistical measures obtained were percentages and confidence interval levels (CI). Chi-squared test was used to evaluate factors potentially associated with urinary incontinence. Logistic regression analysis was used to control potential confounding variables and to determine the independent association between risk factors and urinary incontinence.

Results

The overall prevalence of UI in the study group was 25.5% (90/353 study participants). The most common type of incontinence was stress incontinence (56.2%) fol-

lowed by urge (32.1%) and mixed incontinence (11.7%). Table 1 describes the general profile of the study participants. The median duration of symptoms was 2 years (range – 6 months to 20 years) and majority (74.4%) of the women had symptoms since 1-5 years. The definitions used by previous investigators^{7,9} was used to describe the frequency of incontinence and out of the study participants who had UI, majority (i.e. 32.2% (n=29/90) had infrequent symptoms i.e. strike off less than one day per month, followed by 28.9% (n=26/90) who reported weekly incontinence). Monthly incontinence was reported by 21.1% (n=19/90) and daily incontinence by 17.8% (n=16/90).

Table 1: Characteristics of the study participants (N=353)

Characteristics	Number	Percent
Age groups (yr)		
20-29	74	21.0
30-39	56	15.9
40-49	86	24.4
50-59	79	22.4
60-69	43	12.2
≥70	15	4.2
Occupation		
Housewife	179	50.7
Farm laborers	174	49.3
Parity		
0	27	7.6
1-5	286	81.0
> 5	40	11.4
Having prolonged labor^a		
No	271	79.9
Yes	71	20.1
Having hysterectomy		
No	311	88.1
Yes	42	11.9
Postmenopausal		
No	191	54.1
Yes	162	45.9
Having hypertension		
No	299	84.7
Yes	54	15.3
Having diabetes		
No	339	96.0
Yes	14	4.0
Having chronic cough		
No	333	94.3
Yes	20	5.7
Having chronic constipation		
No	328	92.9
Yes	25	7.1
Doing postpartum heavy work^b		
Before 1st month	47	13.3
After 1st month	127	35.9
Having addiction to mashiri		
No	134	38.0
Yes	219	62.0
Body mass index (kg/m²)		
Underweight (<18)	90	25.5
Normal weight (18-24.9)	201	56.9
Overweight (25-29.9)	54	15.3
Obese (≥30)	8	2.3

^a Excluding 11 nulliparous women, n=342

^b Question asked only to 174 women who worked in farms

Prevalence of incontinence increased with advancing age ($\chi^2 = 23.513$, $df = 5$, $P < 0.001$), from 10.8% in the 20-29 years age group to 41.9% in the 60-69 years age group and 46.7% in the age group of 70 years or more as shown in Figure 1. Univariate analysis to determine association of various risk factors with UI is shown in Table 2. High parity, early post-partum resumption of heavy work (<1 month), hysterectomy, hypertension, diabetes, chronic cough, chronic constipation and menopause were significantly associated with incontinence ($P < 0.050$). However, other factors assessed for increased risk of incontinence but not found significant were history of prolonged labor, heavy work in farms, addictions and high BMI. Variables associated with incontinence ($P < 0.050$) in univariate models were entered into multivariate models. Multivariate Logistic regression analysis was used to control for confounding factors and to determine the association between risk factors and urinary incontinence. In logistic models, age (OR=1.1, 95% CI: 1.1, 1.4), parity>5 (OR=1.6, 95% CI: 1.3, 2.1), diabetes (OR=2.38, 95% CI: 1.6, 4.1), chronic cough (OR=6.27, 95% CI: 2.2, 17.6) and chronic constipation (OR=2.6, 95% CI: 1.8, 3.8) were significantly associated with risk of incontinence as shown in Table 3.

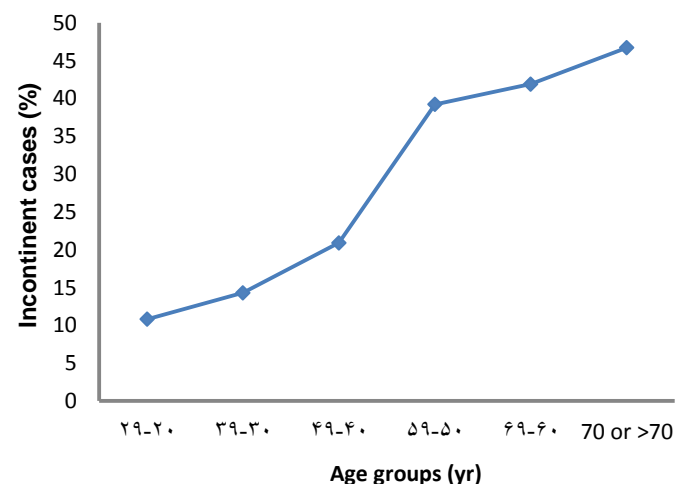


Figure 1: Age wise distribution of women with Incontinence (N=353)

Out of 90 women with UI, only 13 (14.4% of 90) ever discussed their problems with a doctor. Thus, consultation rate was only 14.4%. Most of the women (62.0%) who consulted a doctor for their symptoms were treated medically. Four women referred to a higher centre for further investigations did not comply with this advice while two women were advised surgery for this condition. However, none were told about any exercises for this condition. Table 4 describes the common reasons cited by study participants for not seeking medical help for their condition. No need of treatment as symptoms were not distressing (42.9%), accepting it as normal process of aging (25.2%) and embarrassment (24.5%) were the most common reasons for not seeking treatment.

Discussion

The overall prevalence of UI in this study was 25.5%. The distribution of the types of incontinence was as follows: 56.2% women had stress incontinence, 32.1% had urge, and 11.7% had mixed type. These findings were higher compared to the study conducted by Kumari et

al.¹⁰, who reported the overall prevalence of UI as 12.0%, among whom 46.0% had stress incontinence, 26.0% had urge, and 28.0% had mixed type. It is lesser than the global prevalence of UI which may be due to variations in definitions used, age groups and populations' studied¹¹.

Table 2: Comparison of the factors potentially associated with urinary incontinence using Chi-squared test

Variables	With urinary incontinence		Without urinary incontinence		P value
	Number	Percent	Number	Percent	
Number of previous parities					0.001
0	2	17.8	9	82.2	
1-5	45	18.9	193	81.1	
>5	41	39.4	63	60.6	
Doing heavy work					0.169
No	28	16.0	150	84.0	
Yes	58	28.5	116	71.5	
History of prolonged labor^a					0.114
No	63	23.2	208	76.8	
Yes	23	32.4	48	67.6	
Doing post-partum heavy work^b					0.040
Before the 1st month	19	40.0	28	60.0	
After the 1st month	31	24.4	96	75.6	
Having hysterectomy					0.044
No	73	23.7	235	76.3	
Yes	16	38.1	26	61.9	
Having hypertension					0.002
No	67	22.4	232	77.6	
Yes	23	42.6	31	57.4	
Having diabetes					0.014
No	82	24.2	257	75.8	
Yes	8	57.1	6	42.9	
Having chronic cough					0.001
No	77	23.1	256	76.9	
Yes	13	65.0	7	35.0	
Having constipation					0.001
No	253	77.1	75	22.9	
Yes	15	60.0	10	40.0	
Duration of postmenopausal (yr)					0.033
<10	30	32.3	63	67.7	
10-19	15	27.3	40	72.7	
20-29	5	45.5	6	54.5	
≥30	2	66.7	1	33.3	
Body mass index (kg/m²)					0.740
Underweight (<18)	22	24.4	68	75.6	
Normal weight (18-24.9)	51	25.4	150	74.6	
Overweight (25-29.9)	16	29.6	38	70.4	
Obese (≥30)	1	12.5	7	87.5	

^aExcluding 11 nulliparous women, n=342

^bQuestion asked only to 174 women who worked in farms

Urinary incontinence though an important health problem in the community causing significant morbidity leading to embarrassment, restriction of daily, physical and social activities is often under-diagnosed and is a considerable economic burden on the individual as well as the healthcare system^{12,13}. Identification and early alteration of risk factors of UI can reduce this burden. In this study, the prevalence of UI increased with age from 10.8% in the 20-29 years age group to 46.7% in the age group of 70 years and beyond as shown in Figure 1. Though the exact etiology of higher prevalence of UI

with advancing age, is unclear, it can be partly explained by progressive senile loss of muscle tone, decreased contractility, changes in the hormonal stimulation, and repeated injuries during parturition^{13,14}.

High parity increases the risk for UI; repeated deliveries may cause pelvic floor dysfunction as a result of nerve damage, muscular damage, and direct tissue stretching and disruption^{5,13,14}. A study by Morley et al.¹⁵ concluded that prolonged labor causes collagenous changes in the pelvic floor leading to UI. In this study,

though the proportion of incontinent women with history of prolonged labor was higher, the association was not found to be significant.

Since the study participants belonged to a tribal area where they resume heavy work in farms immediately post-delivery due to financial constraints, a novel attempt was made to assess if resuming work early (<1 month) was associated with increased risk of UI. The association was found to be significant. An interesting observation from this study was that, a higher proportion (28.5%) of

women involved in heavy work in farms had incontinence compared to those women who were housewives (16.0%). However, this association was not found to be significant. Hysterectomy may cause damage to the urethral and bladder supportive structures or to the pelvic nerve plexus, leading to incontinence later in life¹⁶. The association between hysterectomy and UI was found to be significant in this study group. Brown et al.¹⁶ also reported similar findings.

Table 3: Odds ratio (OR) estimates of factors associated with urinary incontinence (with $P < 0.1$) using logistic regression analysis

Variable	With urinary incontinence	Without urinary incontinence	OR	P value
Age group (yr)				0.001
20-29	8	66	1.00	
30-39	8	48	1.10 (0.91,1.33)	
40-49	18	68	1.34 (1.24,1.44)	
50-59	31	48	1.69 (1.57,1.81)	
60-69	18	25	1.81 (1.66,1.97)	
≥70	7	8	0.70 (0.66,0.76)	
Number of previous parities				0.001
0	9	193	1.00	
1-5	63	2	1.30 (1.00, 1.80)	
>5	45	41	1.20 (0.90, 1.60)	
Having hysterectomy				0.044
No	73	16	1.00	
Yes	235	26	1.50 (0.60, 3.60)	
Postmenopausal				0.033
No	65	130	1.00	
Yes	37	121	1.05 (0.80, 1.28)	
Having hypertension				0.002
No	67	23	1.00	
Yes	232	31	2.13 (1.37, 4.35)	
Having diabetes				0.014
No	257	6	1.00	
Yes	82	8	2.38 (1.60, 4.10)	
Having chronic cough				0.001
No	77	13	1.00	
Yes	256	7	6.27 (2.20, 17.60)	
Having constipation				0.001
No	253	15	1.00	
Yes	75	10	2.60 (1.80, 3.80)	
Having addictions to mashiri				0.330
No	58	161	1.00	
Yes	32	102	0.50 (0.20, 0.90)	
Doing heavy work				0.055
No	32	118	1.00	
Yes	58	145	1.60 (0.90, 2.90)	
Having prolonged labor				0.114
No	63	23	1.00	
Yes	208	48	1.60 (0.90, 2.90)	

Table 4: Reasons for not seeking help

Reasons for not taking consultation	Number	Percent
Considering it as normal status of aging	37	35.2
No need of treatment	63	42.9
Shyness/embarrassment	36	24.5
Stigma	4	2.7
Fear of hospitals/surgery	2	1.3
Lack of money/time	5	3.4

^a Many respondents gave multiple answers

Excess body weight may increase abdominal pressure during physical activity, which in turn increases bladder pressure and urethral mobility, leading to urinary inconti-

nence¹⁶. If urinary incontinence is primarily due to increased abdominal pressure, then modest weight reduction may decrease the severity of urinary incontinence. Though, BMI was not found to be a significant predictor in this study, significant association was reported by Brown et al.¹⁶ and Song et al.². Elevated abdominal pressure due to chronic cough and chronic constipation leads to increased risk of UI¹⁷. Both chronic cough and constipation were significant predictors for UI in the regression analysis in our study. Chronic cough or constipation, shown to be associated with incontinence¹⁸, damages the urethral and bladder supportive structures causing urinary

incontinence. Association between UI and medical ailments like diabetes ($P=0.014$) and hypertension ($P=0.002$) found highly significant in this study, has been previously reported^{2,5,16}.

Consultation rate was only 14.4% for incontinence. No need of treatment as symptoms were not distressing (42.9%), accepting it as normal process of aging (25.2%) and embarrassment (24.5%) were the most common reasons for not seeking treatment. The findings are similar to that reported by Kumari et al. (20.0%)¹⁰.

In this study, the data included was obtained solely on verbal response, recall bias for some obstetrical factors may have been present and examination of study participants/intervention could not be taken up due to limited resources and time constraints.

Conclusion

Urinary incontinence is a neglected problem in tribal women, with stress incontinence being the most common type. Simple epidemiological tools such as a questionnaire can unveil the incontinence subjectively. It is predicted by obstetric and other risk factors. However consultation rate was low. An attempt should be made by medical officer/doctor to screen at risk women for urinary incontinence by asking leading questions so that the affected can be timely referred for relevant management.

Acknowledgements

The authors are thankful to the study participants of the tribal area for willingly participating in the study.

Conflict of interest statement

None declared.

Funding

No sources of support provided.

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