International Journal of Multidisciplinary Research and Development
Online ISSN: 2349-4182, Print ISSN: 2349-5979; Impact Factor: RJIF 5.72
Received: 09-11-2020; Accepted: 24-11-2020; Published: 12-12-2020
www.allsubjectjournal.com
Volume 7; Issue 12; 2020; Page No. 50-53

A study on prevalence of urinary incontinence in women with vaginal delivery and its association with age, parity and frequency of caffeine intake

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Abstract
Urinary incontinence is a common problem affecting women in all age groups and has devastating effects on their social, professional and family life. The study aimed to find out the prevalence of Urinary Incontinence in women with vaginal delivery and its association with age, parity and increased frequency of caffeine (tea) intake. This cross sectional study comprised of 110 women who were screened for prevalence of Urinary Incontinence. To detect severity of Urinary Incontinence, validated Marathi version of International Consultation on Incontinence Questionnaire – Short Form (ICIQ - SF) was used.58% of women with vaginal delivery reported of having Urinary Incontinence. Increasing age and parity were found to be positively associated with Urinary Incontinence and increased frequency of caffeine intake was also identified as a risk factor leading to Urinary Incontinence. This study confirmed the prevalence of Urinary Incontinence and its significant association with parity, age and increased frequency of caffeine intake.

Keywords: parity, urinary incontinence, vaginal delivery

1. Introduction
Urinary Incontinence (UI) is a common problem affecting women in all age groups and has devastating effects on their social, professional and family life [1] ICS defines Urinary incontinence as the complaint of any involuntary loss of urine.The prevalence of urinary incontinence in community-dwelling women ranges from 10–40%. Although the prevalence of incontinence may be surprising, women with this disorder often under report or delay seeking treatment for several years after the problem has become bothersome.[2] The inability to control urine is quite an unpleasant and distressing problem. It causes substantial morbidity, social withdrawal and psychological stress. Many women are embarrassed to talk about it, some believe it to be untreatable even in the western countries [3] Vaginal delivery is an established risk factor for Urinary Incontinence. Risk factors for incontinence after vaginal delivery including parity, age, obesity and diabetes have been found in some studies [4] Very few studies have identified factors contributing to increased prevalence of Urinary incontinence in Indian population. The primary aim of this study was to determine the prevalence of Urinary Incontinence in women with vaginal delivery and its types. This study was also designed to identify the association of Urinary incontinence with age, parity and increased frequency of caffeine intake respectively.

2. Material and Methods
A cross – sectional study was conducted and a questionnaire was administered to the women. The study was conducted at the VPMCH, Nashik in the month of July and August 2019.
The study comprised of 110 women who had undergone full term vaginal delivery. Women of age group 20-64 years with singleton pregnancy, full term vaginal delivery and live birth were included in the study. Whereas, women with pre-pregnancy stress urinary incontinence, women pregnant at the time of survey, women suffering from urinary tract infection or other medical diseases during pregnancy and puerperium, any pelvic surgeries or neurologic disease that could affect bladder function were excluded from the study. Women visiting the obstetric and gynaecology OPD, other OPD's and wards in the hospital were screened for incontinence. Also, women employees of the hospital were screened for prevalence of Urinary Incontinence. The urinary tract returns to its pre pregnancy structure and function in about 2 to 3 months, therefore those who had completed 8 weeks after delivery and fulfilling the inclusion criteria were selected for the study.
Those willing to participate in the study were first asked whether they experienced involuntary loss of urine or not. Demographic data along with the obstetric and gynaecological history, past surgical and medical history and personal history were noted. The type of delivery was also noted. On the basis of answers about the urge to urinate and the circumstances of leakage, the incontinence was classified as Stress Incontinence (if leakage was associated with coughing, sneezing, laughing, or lifting heavy items), Urge Incontinence (if leakage was associated with a sudden and strong urge to urinate), or Mixed-type incontinence (if both stress and urge symptoms were present).[5]
To detect severity of Urinary Incontinence, International Consultation on Incontinence Questionnaire – Short Form (ICIQ - SF) was used [6] the validated Marathi version of the ICIQ-SF questionnaire was provided to the participant for their understanding and convenience. This measure contains 4 items for evaluating the frequency of incontinence, amount of leakage, impact of everyday life and activities leading to loss of urine. The first 3 questions are scored on a

scale. The score ranges from 0 to 21 with 0 indicating no urinary incontinence and higher scores suggesting problems with urinary incontinence. The participants were assured about the confidentiality of their information.

3. Results and Discussion

110 women were screened for prevalence of Urinary Incontinence. 64(58%) women reported of having Urinary Incontinence (Fig 1).Mean maternal age was 45.51 years. Proportion of women with incontinence (58.18%) and those without incontinence (41.81%) was calculated. Prevalence ratio for both the populations was estimated and the p value was significant at $p < 0.05$ (Table 1). The most frequent intervention that was carried out during last delivery was episiotomy (53.63%) and the other being spontaneous delivery. Out of the total women having incontinence, highest numbers were found to have Stress Urinary Incontinence i. e. 43 (67.18%) followed by Mixed Urinary Incontinence (31.24) and 1% had Urge Incontinence (Fig 2). Age wise distribution of Urinary Incontinence indicated greater prevalence amongst the middle aged women (Fig3). Urinary Incontinence was found to be positively associated with increasing age and parity. Spearmen rank correlation was use to find out the association between incontinence with age and parity respectively. The incidence of Urinary Incontinence was significantly higher in those with increased frequency of caffeine (tea) intake ($p<0.0001$) (Table 2). Therefore, increased caffeine intake is one of the risk factors contributing to Urinary Incontinence. Multiple regression analysis was used to find out the same.

The outcome measure used for assessing the severity of Urinary Incontinence was ICIQ – SF. It has a total score of 21, categorized as1 to 5 mild symptoms, 6 to 12 moderate symptoms, 13 to 18 severe and 19 to 21 very severe symptoms.[7] Out of the 64 women who reported positively for Urinary Incontinence, 38 (59.37%) experienced moderate symptoms, 25 (39.06%) had mild symptoms and 1% experienced severe symptoms (Fig 4). In the incontinent group, leakage of small amounts of urine once a week or less frequently was mostly reported (Table 3). The most common activities leading to urine leakage were coughing and sneezing, exercise and physical activity. The data was analyzed using Graph Pad Instat software.

4. Discussion

This cross-sectional study analyzed the prevalence of Urinary Incontinence in women of age 20 to 64, relationship of Urinary Incontinence with age, parity and frequency of caffeine intake respectively. Urinary Incontinence was reported based on answers obtained about symptoms leading to Urinary Incontinence. Out of 110 women, 64 women reported of having Urinary Incontinence and prevalence was 58.18%.These results were in agreement with a study conducted by G. Rortveit *et al.* who reported higher prevalence of Urinary Incontinence in women with vaginal deliveries [8].

The most common form of Urinary Incontinence found in this study was Stress Urinary Incontinence (67.18%)followed by Mixed Urinary Incontinence(31.25%).Similar findings were reported by Contreras Ortiz (2004) which stated that Stress Urinary Incontinence was the most common form of Urinary Incontinence followed by Mixed Urinary Incontinence(30% to 40%).[1]Many other studies showed a greater incidence of Stress Urinary Incontinence in women with vaginal delivery in comparison to those undergoing C section.[1,8,10] Causative factors such as pelvic floor muscle, nerve and connective tissue damages that occured during pregnancy to labor and reduced level of estrogen hormone in menopause phase may lead to defects in intrinsic structure of urethral sphincter, urethral hypermobility and damages on urethral supporting tissue which manifest as symptoms of stress UI [11].

Among the factors associated to the prevalence of Urinary Incontinence, age ($p<0.0001$), parity ($p < 0.0006$) and increased frequency of tea intake ($p <0.0001$) showed significant association in this study. Prabhu SA, Shanbhag S (2013) observed a positive relationship between age and prevalence of Urinary Incontinence. This could probably be due to progressive senile loss of muscle tone, decreased contractility, changes in the hormonal stimulation and repeated injuries during vaginal deliveries.[12]Agarwal & Agarwal (2017), reported that increased number of births were associated with persistent urinary incontinence. Repeated deliveries may cause pelvic floor dysfunction as a result of nerve damage, muscular damage and direct tissue stretch and disruption [13] Rortveit *et al*, 2003, also suggested a positive relationship between parity and Urinary Incontinence. Tea is a caffeinated drink. Increased frequency of tea intake was identified as an extremely important contributing factor leading to Urinary Incontinence in this study. Norwegian Epidemiology of Incontinence Study investigated tea intake and its association with Urinary Incontinence and concluded that women consuming tea were more prone to develop all types of incontinence [14] Arya *et al* (2000) observed that high caffeine intake was responsible for increased detrusor excitability [15].

5. Tables and Figures

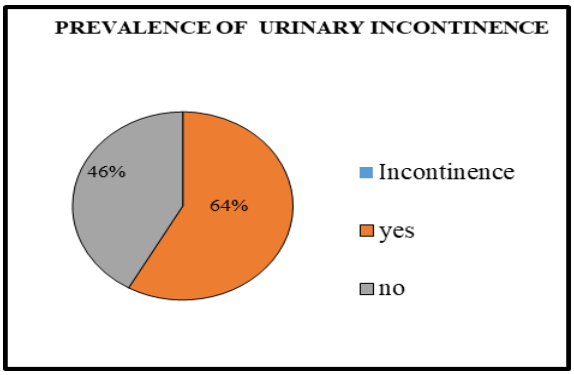

Fig 1: Prevalence of Urinary Incontinence

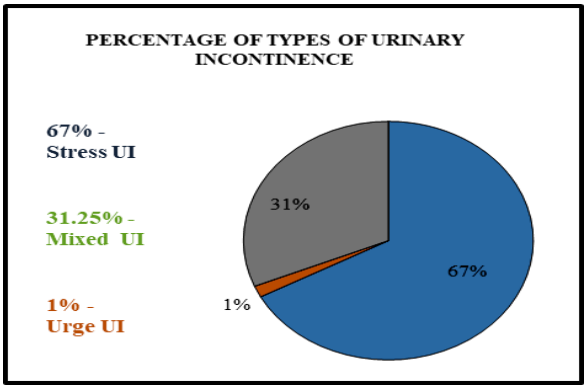

Fig 2: Percentage of Types of Urinary Incontinence

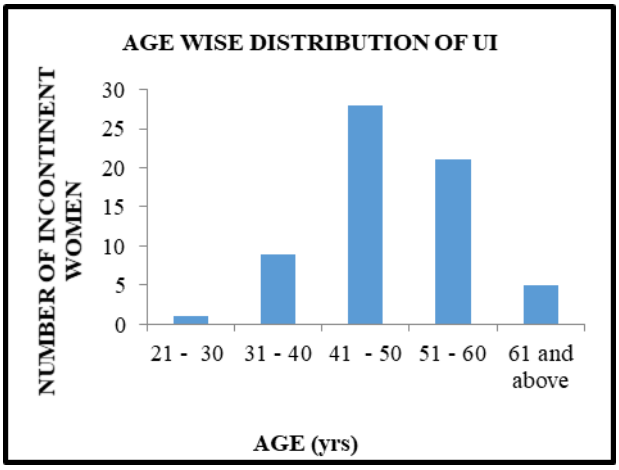

Fig 3: Age Wise Distribution of UI among Women.

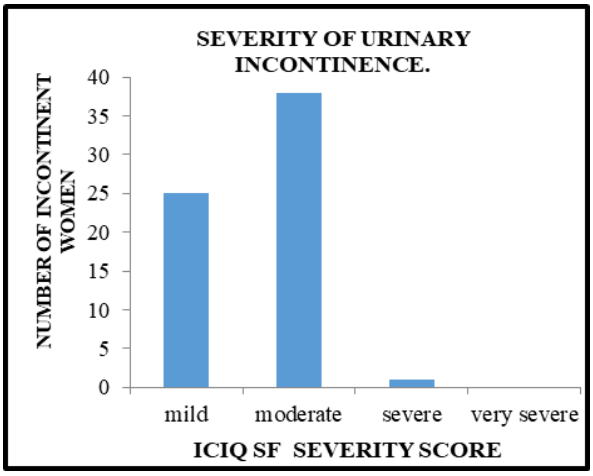

Fig 4: Severity of Urinary Incontinence.

Table 1: Prevalence Ratio of Women with and Without Incontinence

Proportion of women with incontinence	Proportion of women without incontinence	Z value	P value	Significance
P1= 64/110 =0.58	P2= 46/110 =0.41	4.264	<0.00001	Extremely significant

Table 2: Association of Urinary Incontinence with Age, Parity and Frequency of Caffeine Intake.

n = 110	r value	p value	Significance
Parity and ICIQ score	0.3222	<0.0006	Significant
Age and ICIQ score	0.392	<0.0001	Extremely significant
Frequency of tea intake and ICIQ score	t value = 6.284	<0.0001	Extremely significant

Table 3: Frequency of Urine Leakage among Incontinent Women

Frequency of Urine leakage	Number (total - 64)
Once a week	33
2 – 3 days / week	24
Once a day	6
Many times a day	1

6. Conclusion

This study confirmed the prevalence of Urinary Incontinence and its significant association with parity, age and increased frequency of tea intake. Stress urinary incontinence was the most common type of Urinary Incontinence to be reported. Greater prevalence of incontinence was observed in the middle aged women. Urinary Incontinence is a very distressing problem. It should be addressed by creating awareness and educating women about the symptoms and risk factors in order to prevent and also take necessary steps for treatment as soon as possible. Questionnaires would prove as a simple yet important tool for screening women at risk of Urinary Incontinence.

7. Acknowledgment

We are thankful to Dr. Nikki Cotterill for providing and granting us the permission to use the ICIQ - SF questionnaire along with its validated Marathi version.
We also express our sincere gratitude to all the subjects who participated in the study.

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