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PREVALENCE OF URINARY INCONTINENCE AND ITS ASSOCIATION WITH RISK OF FALL AND QUALITY OF LIFE IN ELDERLY WOMEN – A CROSS – SECTIONAL STUDY

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ABSTRACT **Objectives:** To find out the prevalence of urinary incontinence (UI) and its association with risk of fall and quality of life in elderly women. **Materials and method:** Total of 498 elderly women participated in the study according to the inclusion and exclusion criteria. All the women were screened for UI and the women presenting with incontinence were further assessed for risk of fall and quality of life. **Results:** The study found the prevalence of urinary incontinence to be 41.3%. The association between Incontinence with Risk of fall and Quality life was positively correlated. **Conclusion:** This study concluded the prevalence of urinary incontinence and its types in elderly women and also found the association of UI with risk of fall and quality of life respectively.

KEYWORDS :

INTRODUCTION

In India, a 'senior citizen' or 'older adults' is defined as a person aged 60 years and older. This is the fastest growing population in India, from 6.7% in 1991 to 10% in 2021. In older persons, urinary incontinence can cause significant morbidity (such as falls and fractures) and functional impairment.

International Continence Society defined Urinary Incontinence as "the complaint of any involuntary loss of urine that is a social or hygienic problem"[3]. There are 3 different types of Urinary Incontinence: Urge Urinary Incontinence – It is the complaint of involuntary leakage of urine accompanied by or immediately preceded by urgency[3].

It is usually associated with uninhibited bladder contractions, known as detrusor over-activity (DO). Frail older persons may have DO but there is not sufficient detrusor contraction to fully empty the bladder, which leads to increased post-voidal residual volume (PVR)[4]. Stress Urinary Incontinence – It is the complaint of involuntary leakage of urine on effort or exertion, or on sneezing or coughing[3]. It is associated with increased intra-abdominal pressure.

It occurs with impaired urethral sphincter support or damage impairing urethral closure[4]. Mixed Urinary Incontinence – It is the complaint of involuntary leakage of urine associated with urgency and also with effort, exertion, sneezing or coughing [3]. It has symptoms of leakage with characteristics of both stress and urge urinary incontinence and is most common in younger-old women. Either urge or stress urinary incontinence may predominate[4].

The worldwide prevalence of urinary incontinence in the elderly women is 37.1%, with highest prevalence reported in Asian population with 45.1% [5]. Various studies have listed risk factors associated with urinary incontinence among which ageing, menopause, type of delivery, number of deliveries, obesity, and diabetes are important factors[5].

Ageing is one of the important factors for urinary incontinence. Age related changes in elderly includes decreased bladder capacity, sensation of filling, speed of contraction of detrusor muscle, pelvic floor muscle bulk and resistance and decreased urinary flow rate. There is increased frequency of urination and post-voidal residual volumes [7].

Falls as defined by World Health Organization (WHO), is an event which results in a person coming to rest inadvertently on the ground or floor or other lower level, excluding intentional change in position to rest. The prevalence of falls in Indian older adults ranges from 14% to 53% [12]. Falls are associated with the geriatric syndromes of depression, cognitive impairment, urinary incontinence and chronic diseases, especially cardiovascular disease.

Older adults have one or more than one chronic disease, and the risk of fall increases with the number of chronic diseases [12]. Urinary incontinence is one of the 'geriatric giants' which also includes falls, depression, cognitive impairment and chronic conditions. Association between falls and urinary incontinence can be theorized as rushing to the toilet to avoid leakage can result in to falls.

Urinary incontinence can be sensed as a 'stigma' and a cause of embarrassment in social gatherings. There is sense of impending embarrassment and shame associated with public loss of bladder control [10]. People experiencing urinary incontinence and falls are more likely to report effects on their social life, symptoms of distress and perception of poor quality of life [15].

MATERIALS AND METHODOLOGY

Type of Study: Cross-sectional study

Study Setting: Residential areas, Old age homes, Tertiary care hospitals

Study Population: Elderly women (60 – 80 years of age)

Sampling Method: Convenient Sampling

Sample Size: 498

Inclusion Criteria:

- Gender: Female
- Age: 60 – 80 years of age

Exclusion Criteria:

- Patients with cognitive impairments.
- Patients with auditory deficits.
- Patients with renal impairments (Acute Kidney Injury, Chronic Kidney Injury, Renal Failure)
- Cystolithiasis, Tumor pressing on bladder
- Neurological conditions – Multiple Sclerosis, Stroke, Parkinson's disease, Spinal cord injury, Brain tumor
- Women with history of fall for reasons other than Urinary Incontinence
- Patients unwilling to participate
- Use of Medications (Calcium channel blockers, Diuretics, Psychotropic drugs, Non-steroidal anti-inflammatory drugs)

Procedure:

This is a cross-sectional study design, in which participants were recruited only after approval from the Institutional Ethical Committee clearance. A written informed consent form was obtained. The nature and purpose of the study were explained to the participants. Participants were screened for inclusion & exclusion criteria. Demographic data were taken which included their name, age, level of education, occupation, socio-economic status, marital status, menstrual and obstetric history, medical and surgical history, drug history. Anthropometric measurements like height & weight were taken and BMI was calculated.

The study was done in two phases. In the first phase, all 498 elderly women were screened for urinary incontinence using Questionnaire for Urinary Incontinence Diagnosis (QUID).

In the second phase, the women having urinary incontinence were assessed for the risk of fall using Fall Risk Questionnaire (FRQ), the severity of the incontinence using Incontinence Severity Index and the quality of life using Incontinence Impact Questionnaire – 7 (IIQ – 7).

RESULTS

Statistical analysis was done using SPSS software version 24. Prevalence of Urinary Incontinence was analysed by summarizing with frequency and percentage. Normality testing was done using Kolmogorov Smirnov test. Study variables did not follow normal distribution hence, Non parametric test spearman's correlation coefficient was used for further analysis.

Table 1: Analysis of descriptive statistics of participants for categorical variables.

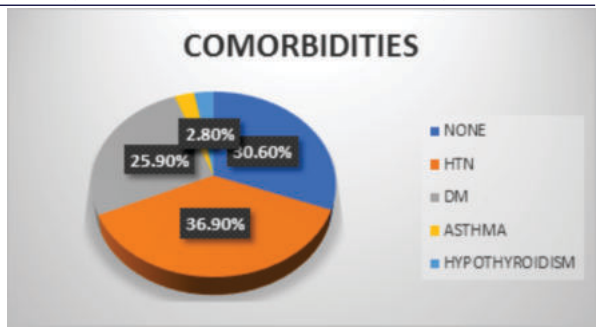
Sr. No	Variable		Frequency (Percentage)
1.	Education	Primary	271 (54.4%)
		Secondary	119 (23.9%)
		Higher secondary	64 (12.9%)
		Graduate	44 (8.8%)
2.	Occupation	Housemaker	394 (79.1%)
		Retired	68 (13.7%)
		Employed	9 (1.8%)
		Self employed	27 (5.4%)
3.	Marital status	Married	359 (72.1%)
		Widowed	131 (26.3%)
		Unmarried	7 (1.4%)
		Divorced	1 (0.2%)
4.	Socioeconomic Status	Upper Class	14 (2.8%)
		Middle Class	350 (70.3%)
		Lower Class	134 (26.9%)
5.	Type of Delivery	FTND	481 (96.6%)
		LSCS	3 (0.6%)
		None	14 (2.8%)
6.	Addictions	None	467 (93.8%)
		Tobacco chewing	31 (6.2%)
7.	Beverage	None	47 (9.4%)
		Tea	441 (88.6%)
		Coffee	10 (2%)
8.	Number of Medications taken	0 – 1	376 (75.5%)
		2 – 3	104 (20.9%)
		4 – 5	18 (3.6%)
9.	Number of deliveries	0 – 3	328 (65.8%)
		4 – 6	167 (33.5%)
		7 – 9	3 (0.6%)

Table 2: Analysis of Descriptive Statistics of Participants for Continuous Variables

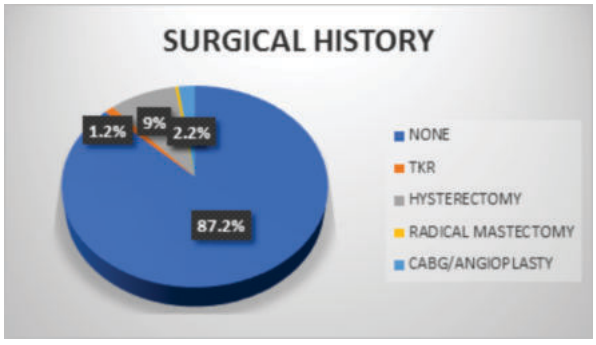
Sr. No.	Variables	Mean ± SD*
1.	Age (in years)	66.11±5.89
2.	Age at Menarche (in years)	12.69 ± 1.24
3.	Age at the time of first pregnancy (in years)	18.64 ± 4.23
4.	Interval between two children (in years)	2.31± 1.48
5.	Age at Menopause (in years)	47.61± 5.32
6.	BMI (in kg/m2)	26.39± 3.89
SD* - Standard Deviation		

Table 3: Analysis of Descriptive Statistics of participants for Outcome Measures

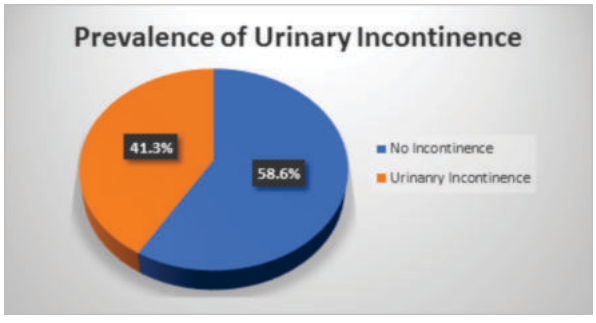
Sr. No.	Score	Median (IQR*)
1.	IIQ – 7	47.67 (38 – 66.67)
2.	ISI	4 (3 – 6)
3.	CDC FRQ	6 (5 – 8)
IQR* – Inter Quartile Range		



Graph 1: Percentages of co-morbidities present in the Participants



Graph 2: Surgical History of Participants



Graph 3: Prevalence of Urinary Incontinence

The results show that out of 498 elderly women participated in the study 206 participants (41.3%) were diagnosed with Urinary Incontinence. Among the elderly women having urinary incontinence, the commonest type is Urge incontinence (74.76%) followed by mixed incontinence (23.30%) and then stress incontinence (1.94%).

Table 4: Association between Severity of urinary incontinence, Quality of life and Risk of Fall

	Severity of Incontinence		Interpretation	Level of correlation
Quality of Life	rho	p value	Significant	Very high positive correlation
	0.968	0.000		
Risk of Fall	0.958	0.000	Significant	Very high positive correlation

DISCUSSION

In this study we found out that out of 498 elderly women, 206 were diagnosed with urinary incontinence. Therefore, the prevalence of urinary incontinence found in this study was 41.3%. The highest prevalence was found out to be of urge incontinence with 74.76%, followed by mixed incontinence with 23.30% and then stress incontinence with 1.94%.

The reason for such a high prevalence may be due to the age related changes in the urinary system. Age related changes in the lower urinary tract includes decreased bladder capacity, sensation of filling, speed of contraction of detrusor, pelvic floor muscle bulk, sphinteric resistance and urinary flow rate; there is increased urinary frequency, post void residual volume [7].

It is noted in this study that urge and mixed incontinence is more

common in elderly women than stress incontinence. It is also noted that urinary incontinence is more prevalent in the 70 – 80 years of age group.

In a study done by Carlo Vechioli – Scaldazza et. al. on urodynamic parameters in women having urinary incontinence found that Detrusor overactivity was common in elderly. Urethral sphincter function declines with age resulting in a highly significant decrease of the MUCP. This finding indicates a decrease in outflow resistance, and shows the structural and functional changes of the urethra with aging. These findings explain the high prevalence of urge and mixed incontinence with aging [32].

As per a study done by Kuchel GA et. al., in people over the age of 65 years, the prevalence of urge urinary incontinence is more than stress urinary incontinence and the prevalence of mixed urinary incontinence remains stable [9].

It has been noted in our study that BMI (26.39± 3.89) and Diabetes (25.9%) are associated with the presence of urinary incontinence. Post-menopausal changes resulting from lack of estrogen is also a major contributing factor in female urinary incontinence. Lack of estrogen causes diminished vascular, muscular and epithelial trophism in the lower urinary tract.

Urinary incontinence is considered as one of the 'Geriatric Giants' which also includes falls, depression, cognitive impairment and chronic conditions.

We found out that severity of urinary incontinence and risk of fall have a very high positive correlation (rho=0.958). The association between urinary incontinence and falls is that there is a rush to reach toilet before there is any leak which increases the risk of fall [10]. In our study, many subjects reported that many times when they get an urge to urinate and rush towards the toilet, they feel like they are losing their balance. Many subjects reported that they have nocturia which disturbs their sleep and had fallen mostly during the night time.

In our study we tried to find the association between severity of incontinence and quality of life which showed very high positive correlation (rho=0.968). The issue of incontinence is important in old age as it can lead to embarrassment, social isolation and a feeling of low self-worth [15]. In many areas it is also sensed as a social stigma and embarrassment in social gatherings. Many subjects in our study have reported that they have stopped going to social and family gatherings due to problems with the availability of toilet and an impending sense of being ashamed if there is any involuntary loss of urine.

Urinary incontinence disrupts the activities of daily living including household work which majority of our subjects complained about. It has an impact of psychosocial health leading to a poorer quality of life. Urinary incontinence is an important geriatric syndrome, not only as a condition in itself but also has a huge impact on individual's quality of life which is neglected.

CONCLUSION

The study concluded the prevalence of urinary incontinence in elderly women with urge urinary incontinence being more prevalent. The study came to the conclusion that the severity of urinary incontinence was significantly associated to risk of fall and the quality of life in elderly women.

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