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Original Research Article

Prevalence and Predictors of Chronic Genitourinary Conditions in Older Women in India: Longitudinal Ageing Study in India Findings

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Abstract

Introduction: When it comes to longevity, women outlive males. This does not ensure a healthy existence, either, as women are typically marginalised in society. Furthermore, a number of normal physiological changes that occur in women during midlife are accompanied with chronic illnesses, such as genitourinary disorders. This study set out to determine the prevalence and correlates of chronic renal failure, incontinence, and kidney stones in Indian women over the age of 45.

Methods: Data from the Longitudinal Ageing Study in India (LASI) wave-1, which took place between 2017 and 2018, was used. The study comprised 32,097 women in total who were 45 years old. Descriptive statistics and a 95 percent confidence interval as a measure of uncertainty were employed to report prevalence. To examine the link between several sociodemographic and behavioural predictors and the outcome, which included chronic renal failure, incontinence, and kidney stones, a separate multivariable regression analysis was carried out.

Results: Incontinence was present in 2.9 percent (95% CI: 2.72-3.09), chronic renal failure was present in 0.53 percent (95% CI: 0.45-0.62), and diabetes was present in 2.28 percent (95 percent CI: 2.11-2.45). Those over the age of 75 had a greater risk of incontinence, according to the multivariable regression analysis [AOR: 1.81 (95 percent CI: 1.34-2.44)]. Those who were obese had a significantly increased risk of kidney stones (AOR: 1.98; 95% CI: 1.53-2.55).

Conclusion: We found that chronic genitourinary diseases were significantly more common in elderly women, which is important to note. It is important to improve the recently established Health and Wellness Centers (HWCs), which have the potential to be a window of opportunity for equitable and timely care.

Keywords: Ageing, women, India, chronic genitourinary diseases, incontinence, kidney stones, and chronic renal failure

Introduction

Poor patient-reported health outcomes, frequent trips to the hospital, and the need for sophisticated care are typically linked to ageing [1]. When it comes to longevity, women outlive males [2]. This does not, however, ensure a healthy existence because, as a result of cultural and societal standards, women are typically disadvantaged members of society [3]. Moreover, early-onset chronic diseases are more common in women than men [3]. In their middle years, women commonly go through a number of normal physiological changes that are accompanied with chronic illnesses, such as genitourinary illnesses. Incontinence, reduced renal output, and urolithiasis are only a few of the symptoms that characterise genitourinary diseases [4]. These illnesses can be lethal, especially for women. Although female hormones are renoprotective, ageing may cause genitourinary problems due to decreasing oestrogen levels [5]. The three most prevalent genitourinary issues are kidney stones, incontinence, and chronic renal failure.

Chronic renal failure, regardless of the cause, refers to the final stage of chronic kidney disease in which the eGFR is reduced to 15ml/min/1.73 m^2 [6,7]. This condition is frequently associated with a high morbidity and mortality rate. Micturition is a voluntary process that involves the complex coordination of the bladder, urethra, supporting tissues, and muscles. Any hiccup in the process can result in urinary incontinence (UI). Urinary incontinence is a multifactorial syndrome that is defined as any unintentional urine leaking and is especially prevalent in older women. Over 200 million people worldwide suffer from incontinence [8]. It is most common in women because they have to go through complex physiological changes such as childbirth, menstruation, and hormonal changes during the menopausal transition [9]. Patients rarely acknowledge UI, especially in old age, because it is considered a natural result of ageing and is often associated with stigma and shame [10]. This frequently results in low self-esteem and social isolation, as well as psychological outcomes such as anxiety, depression, deterioration of sexual life, and a decrease in physical activity [11]. Kidney stones are painful urologic disorders that are frequently associated with genetic predisposition and dietary habits such as diets high in animal proteins, refined sugar, and oxalate-rich food [12]. It can also be caused by an excess of vitamin D and gout. It can cause low urinary volume, hyperoxaluria, hypercalciuria, and hyperuricosuria, as well as severe abdominal and lower back pain [12].

The risk of developing renal disorders increases with age. However, the factors influencing prevalence are multifaceted and should be investigated further. Furthermore, gender influences health outcomes, particularly in low- and middle-income countries like India, where women's health is still limited to sexual and reproductive age. Existing programmes such as Reproductive, Maternal, Neonatal, Child, and Adolescent Health (RMNCH+A) focus on the needs of reproductive-aged women; however, the health of women beyond this age group is neglected, necessitating the generation of evidence. As a result, this study was carried out in India to estimate the prevalence and determine the correlates of chronic renal failure, incontinence, and kidney stones in women aged 45 years.

Methods

Overview of data

A community-based cross-sectional study was conducted using data from the Longitudinal Ageing Study in India (LASI),

2017–2018, first wave. On the LASI, wave-1 biennial longitudinal survey of older individuals aged 45 and up, the International Institute of Population Sciences (IIPS), Harvard T. H. Chan School of Public Health (HSPH), and the University of Southern California worked together (USC). Data were gathered from all 26 Indian states and six Union Territories, with the exception of Sikkim. Using a multistage stratified area probability cluster sampling design, 72,250 participants from the nationally representative sample were selected. To reach the primary sampling unit, a three-stage sampling design was utilised in rural regions and a four-stage sampling strategy in urban areas [13].

Study participants and sample size

Individual datasets (n=72,250) and biomarkers (n=65900) were integrated for this investigation. Following this, missing data were eliminated, leaving a total of (n=65900) participants with complete data. Next, after excluding men and participants aged 44 and younger, we included females aged 45 and over. 32,097 women over 45 made up the final sample size.

Variables

Independent variables

We divided the population into age groups of 45–59 years, 60–74 years, and 75 years based on the reported age in years. Residence was defined as currently residing in rural or urban areas, while caste was classed as currently residing in rural or urban areas. Caste was further subdivided into scheduled caste, scheduled tribes, other backward class, and others. To gauge the participants' level of education, we employed two different questions. Those who responded "no" were labelled as having "no formal education." The first question asked, "Have you ever attended school?" required a yes or no response. What is the highest degree of education you have attained? was the next question posed to participants who had selected "yes." Three categories were created as a result, starting with "up to primary," which combined instruction from standards 1-4. and grades 5-7; middle schoolers; high school grads; diploma holders; and the final group, which consisted of graduates and post-graduates. and people with professional degrees. Using two items from the LASI individual survey schedule, occupation was also examined. The first question asked participants if they had ever worked for at least three months in their life; those who replied "no" were categorised as never having worked. Next, based on the question 'are you now working?' persons were grouped as 'currently working' and 'currently not working'. The wealth index was divided into four categories based on monthly per capita spending: most deprived, 2, 3, 4, and most wealthy.

Tobacco usage was measured by asking participants if they had ever smoked or used smokeless tobacco. Those who responded "no" were categorised as abstainers. What kind of tobacco product have you ever consumed, was the subsequent question posed to those who had previously responded "yes"? With choices like "smoke tobacco" classed as "smoking," "smokeless tobacco" classified as "smokeless tobacco," and "both smoke and smokeless" classified as "dual use," among others. To measure alcohol consumption, the question "have you ever drunk any alcoholic beverages such as beer, wine, liquor, country liquor, etc.?" was used. with "yes" or "no" answers. Weight in kg/height in m2 was used to compute Body Mass Index (BMI), and persons were considered obese if their BMI was higher than 25, as stipulated for the South. Asian population [14].

Outcome variables

Female genitourinary conditions were the key outcome factors of interest. While answering the question "Have you ever been diagnosed with any of the following urogenital illnesses or diseases?" the self-reported conditions were taken into account. The three reported conditions were incontinence, chronic renal failure, and kidney stones.

Statistical Analysis

Version 17.0 of STATA statistical software was utilised for the analysis (Stata Corp, College Station, TX, USA). Using descriptive data like frequency and percentage across various socio-demographic factors, the prevalence of chronic conditions was characterised. To investigate the link between outcome variables and other socio-demographic indicators, several multivariable logistic regression models were tested. Using survey weights, all weighted analyses were carried out. We provided the 95 percent confidence range for each weighted proportion as a measure of uncertainty.

Ethical Considerations

TThe current study is based on anonymous data from the public domain. The original LASI survey, on the other hand, received ethics approval from the Indian Council of Medical Research (ICMR) in New Delhi and IIPS in Mumbai. All participants were required to provide prior written informed consent.

Results

The participants' average age was 59.2410.45 years. The majority of participants (53.8 percent) were 45-59 years old, from rural areas (64.8 percent), and had no formal education (60.8 percent). Obesity was observed in 33.8% of the participants. The overall prevalence of chronic renal failure was 0.53 percent (95 percent confidence interval: 0.45-0.62), incontinence was 2.9 percent (95 percent CI: 2.72-3.09), and kidney stones were 2.28 percent (95 percent CI: 2.11-2.45).

Participants aged 60-74 years had a higher (0.58 percent) prevalence of chronic renal failure than other age groups. Chronic renal failure was more common in urban residents than in rural residents. Individuals with the highest level of education had the highest (1.10 percent) prevalence of chronic renal failure. Chronic renal failure was more common in the most affluent group.(Table 1).

Incontinence was more prevalent among participants aged ≥75 years. Rural residents had a higher prevalence (2.95%) of incontinence than urban residents. Participants who did not work currently had a higher prevalence (3.23%) of incontinence. Smokeless tobacco users had the highest prevalence of incontinence than those who used other forms of tobacco. The prevalence of incontinence was higher (2.94%) among obese individuals (Table 1).

Kidney stones were found to be extremely common among participants aged 45-59 years. The prevalence of kidney stones was higher in cities (2.60 percent) than in rural areas. Kidney stones were more common (3.06 percent) among the wealthiest groups. Dual tobacco users had a higher prevalence of kidney stones (2.77 percent) (Table 1).

Table 1: Prevalence of genito-urinary conditions across various socio-demographic characteristics of the study population

Socio-demographic Characteristics		Chronic Renal Failure	Incontinence	Kidney Stones
Age	45-59 years	85 (0.51)	352 (2.14)	411 (2.50)
	60-74 years	72 (0.58)	398 (3.22)	274 (2.22)
	≥75 years	14 (0.53)	181 (5.51)	46 (1.42)
Residence	Rural	99 (0.45)	650 (2.95)	471 (2.13)
	Urban	72 (0.73)	281 (2.80)	260 (2.60)
Caste	Scheduled Castes	28 (0.46)	160 (2.57)	113 (1.81)
	Scheduled Tribes	12 (0.44)	68 (2.45)	50 (1.82)
	Other Backward Class	60 (0.41)	297 (2.04)	277 (1.90)
	Other	67 (0.81)	383 (4.64)	288 (3.49)
Education	No Formal Education	99 (0.47)	582 (2.77)	416 (1.98)
	Up to Primary	33 (0.55)	237 (3.96)	169 (2.83)
	Middle school to Higher Secondary & Diploma	31 (0.72)	93 (2.14)	122 (2.80)
	Graduation & above	8 (1.10)	19 (2.48)	24 (3.14)
Occupation	Never Worked	102 (0.70)	466 (3.17)	339 (2.31)
	Currently not working	42 (0.54)	249 (3.23)	187 (2.43)
	Currently working	27 (0.28)	216 (2.23)	205 (2.12)
Wealth Index	Most Deprived	37 (0.54)	194 (2.84)	98 (1.43)
	2	17 (0.25)	188 (2.76)	152 (2.24)
	3	39 (0.60)	200 (3.05)	147 (2.23)
	4	31 (0.49)	167 (2.64)	164 (2.61)
	Most Affluent	47 (0.84)	182 (3.27)	170 (3.06)
Tobacco	Abstainer	141 (0.55)	687 (2.67)	603 (2.34)
	Smokeless	24 (0.47)	200 (3.90)	99 (1.94)
	Smoking	6 (0.62)	34 (3.23)	25 (2.42)
	Dual	1 (0.24)	9 (8.64)	3 (2.77)
Alcohol	Yes	4 (0.50)	19 (2.28)	14 (1.64)
	No	167 (0.54)	911 2.92)	717 (2.30)
BMI	Obese	96 (0.44)	634 (2.94)	363 (1.68)
	Not Obese	69 (0.69)	282 (2.79)	362 (3.58)

The bivariate analysis revealed that BMI was significantly associated with chronic renal failure [OR: 1.54 (95 percent CI: 1.00-2.39)], whereas after adjusting for other socio-demographic and health behaviours, there was no significant association between the two (Table 2). Incontinence was also associated with participants aged 75 years [OR: 1.75 (95 percent CI: 1.31-2.35)], smokeless tobacco users [OR: 1.48 (95 percent CI: 1.18-1.86)], and dual tobacco users [OR: 3.45 (95 percent CI: 1.50-7.93)]. The multivariable regression analysis revealed that participants aged 75 years had a higher risk of incontinence [AOR: 1.81 (95 percent CI: 1.34-2.44)]. Smokeless tobacco users were more likely to have incontinence [AOR: 1.46 (95 percent CI: 1.15-1.85)] than dual tobacco users [AOR: 3.35 (95 percent CI: 1.42-7.93)]. For kidney stones, the third regression model was used. According to the bivariate analysis, kidney stones are significantly associated with the wealth index and obesity. The multivariable regression analysis revealed that the most

affluent group had a higher chance of having kidney stones [AOR: 1.77 (95 percent CI: 1.22-2.57)]. Obese participants had a significantly higher risk of kidney stones [AOR: 1.98 (95 percent CI: 1.53-2.55)].

Table 2: Association between genito-urinary conditions with various socio-demographic attributes

Socio-demographic Characteristics		Chronic Renal Failure		Incontinence		Kidney Stones	
		OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
Age	45-59 years	0.88 (0.56-1.37)	0.81 (0.50-1.31)	0.66 (0.53-0.81)	0.65 (0.53-0.81)	1.13 (0.89-1.43)	1.06 (0.83-1.35)
	60-74 years	1		1		1	
	≥75 years	0.76 (0.39-1.50)	0.76 (0.38-1.54)	1.75 (1.31-2.35)	1.81 (1.34-2.44)	0.63 (0.41-0.97)	0.76 (0.50-1.16)
Education	No Formal Education	0.43 (0.16-1.12)	0.52 (0.18-1.52)	1.12 (0.55-2.30)	0.91 (0.44-1.85)	0.62 (0.34-1.13)	0.98 (0.53-1.83)
	Up to Primary	0.49 (0.17-1.42)	0.57 (0.19-1.71)	1.62 (0.78-3.36)	1.44 (0.69-2.98)	0.89 (0.47-1.71)	1.19 (0.62-2.31)
	Middle school to Higher Secondary & Diploma	0.65 (0.22-1.91)	0.72 (0.24-2.13)	0.86 (0.40-1.84)	0.84 (0.39-1.79)	0.88 (0.46-1.71)	0.99 (0.51-1.95)
	Graduation & Above	1		1		1	
Wealth Index	Most Deprived	1		1		1	
	2	0.46 (0.22-0.96)	0.45 (0.21-0.93)	0.97 (0.72-1.30)	0.94 (0.70-1.26)	1.58 (1.03-2.42)	1.50 (0.98-2.28)
	3	1.12 (0.60-2.01)	0.99 (0.52-1.87)	1.07 (0.78-1.47)	1.04 (0.76-1.44)	1.57 (1.07-2.32)	1.43 (0.96-2.12)
	4	0.91 (0.49-1.72)	0.82 (0.43-1.56)	0.93 (0.68-1.26)	0.92 (0.67-1.25)	1.85 (1.28-2.65)	1.61 (1.11-2.33)
	Most Affluent	1.56 (0.87-2.81)	1.20 (0.64-2.25)	1.16 (0.84-1.59)	1.15 (0.82-1.60)	2.18 (1.52-3.12	1.77 (1.22-2.57)
Tobacco	Abstainer	1		1		1	
	Smokeless	0.85 (0.47-1.53)	1.02 (0.56-1.86)	1.48 (1.18-1.86)	1.46 (1.15-1.85)	0.82 (0.60-1.13)	0.97 (0.70-1.34)

	Smoking	1.13 (0.47-2.74)	1.43 (0.57-3.54)	1.22 (0.83-1.78)	1.24 (0.84-1.84)	1.03 (0.66-1.61)	1.35 (0.86-2.12)
	Dual	0.43 (0.15-1.21)	0.55 (0.19-1.57)	3.45 (1.50-7.93)	3.35 (1.42-7.93)	1.18 (0.34-4.08)	1.59 (0.46-5.54)
Alcohol	Yes	0.92 (0.31-2.72)	1.09 (0.35-3.38)	0.77 (0.45-1.31)	0.68 (0.39-1.19)	0.71 (0.36-1.39)	0.88 (0.45-1.74)
	No	1		1		1	
BMI	Obese	1.54 (1.00-2.39)	1.37 (0.82-2.26)	0.95 (0.77-1.17)	1.06 (0.86-1.31)	2.17 (1.72-2.73)	1.98 (1.53-2.55)
	Not Obese	1		1		1	

Discussion

Women in their forties (around 45 years old) begin to develop a variety of chronic conditions that could be attributed to hormonal changes [3]. Chronic renal failure was found to be less common in women, whereas incontinence and kidney stones were more common. Chronic renal failure was more common among participants aged 60-74 years, who lived in cities, were the most educated, and had the most money. Incontinence was found to be significantly associated with higher age, smokeless and dual tobacco use. We observed kidney stones to be significantly associated with the most affluent group and obesity.

The prevalence of chronic renal failure was 0.53 percent, which agrees with the findings of a similar study conducted in India using nationally representative data [15]. Our findings are also consistent with the findings of a study conducted in Delhi, which found that the prevalence of chronic renal failure was around 0.78 percent among adults aged 16 and up [16]. Chronic renal failure was found to be more common among adults aged 60-74 years, which could be due to its association with other chronic conditions such as hypertension and diabetes, which are common around this age. Evidence suggests that the prevalence of multiple chronic illnesses increases with age, which may lead to chronic renal failure due to physiological processes and the effects of polypharmacy on the kidney [17]. Furthermore, the rise in the prevalence of multimorbidity in India, as demonstrated by a community-based study that found the prevalence of multimorbidity to be around 51.1 percent among adults aged 60 and older, will increase the risk of chronic renal failure [18]. Patient-centered care is required to mitigate this. Furthermore, social determinants of health have an impact on chronic diseases, as evidenced by the current study, where chronic renal failure is more prevalent among urban residents, the most educated, and the most affluent group [19].

We discovered that the prevalence of incontinence was around 2.9 percent, whereas a facility-based study found that the prevalence of incontinence was 27 percent among women aged 50 and up living in West Bengal [20]. The difference in prevalence could be due to recall bias in our self-reported community-based data, whereas prescriptions can be cross-checked in the facility-based study. However, our findings contradict the findings of a community-based study conducted among women aged 60 and

older, which reported a prevalence of urinary incontinence of around 16% and 23% among urban and rural residents, respectively [21]. Nonetheless, evidence suggests that urinary incontinence reduces women's quality of life [22]. We discovered an association between incontinence and tobacco use, which is consistent with the findings of a facility-based study conducted among Indian women [23]. Tobacco may harm the urethral sphincter by increasing collagen synthesis and causing vascular changes.

The prevalence of kidney stones was found to be 2.28 percent; however, a review including India found that the prevalence of renal stones ranged from 0.5 percent to 0.75 percent, which is lower than our study's findings [24]. In contrast to the findings of an Iranian study, we found kidney stones to be significantly associated with the most affluent group [25].

The socioeconomic disparities between the two countries could be one reason for this. In addition, different food habits in India have been linked to kidney stones [26]. Obesity was found to be associated with a higher risk of kidney stones, which is consistent with previous evidence suggesting a link between the two [27].

Implications for policy and practice

The current study reveals a high prevalence of genitourinary conditions, indicating the need for a continuum of care. Health and Wellness Centres (HWCs) can serve as a window of opportunity for providing egalitarian and responsive timely care while maintaining the cascade of care needs in this situation. Furthermore, because women are often vulnerable and have little say in decision-making, it will be easier for them to seek care near their home.

Furthermore, the findings indicate a need for women to quit smoking, which could be accomplished through culturally and linguistically tailored gender-specific messages for behavioural change communication [28]. Certain risk factors, such as obesity, must be addressed through ongoing motivation to engage in physical activities. Frontline workers or Community Health Officers who screen at-risk populations for noncommunicable diseases could do this.

Strengths and limitations

We extrapolated our findings using a nationally representative sample, which has a higher generalizability. Our study is limited, however, by the use of self-reported conditions, which can result in recall bias. Furthermore, this can cast doubt on the precise population prevalence. Furthermore, because this study is based on cross-sectional data, causality cannot be established.

Conclusion

We discovered a significant prevalence of chronic genitourinary conditions among elderly women, which should not be overlooked. The newly formed Health and Wellness Centres (HWCs) can be a window of opportunity for equitable and responsive timey care, which should be strengthened further.

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