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Prevalence And Clinical Correlation Of Lower Urinary Tract Symptoms In Patients With Cardiovascular Diseases: An Observational Study

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Abstract

Background: Lower urinary tract symptoms (LUTS) are highly prevalent in the aging population and have significant implications on quality of life. Emerging evidence suggests a potential link between LUTS and cardiovascular diseases (CVD). This study investigates the prevalence and clinical correlation of LUTS in patients with CVD.

Methods: A cross-sectional observational study was conducted on 160 patients admitted for cardiovascular conditions, including coronary artery disease, heart failure, and arrhythmia. LUTS severity was assessed using the International Prostate Symptoms Score (IPSS). Demographic and clinical parameters, including age, gender, body mass index (BMI), and comorbidities such as hypertension and diabetes, were recorded.

Results: Moderate to severe LUTS was observed in 38.1% of patients, with a mean age of 63.7 ± 10.9 years. Patients with coronary artery disease exhibited higher LUTS severity (mean IPSS: 10.2) compared to those with heart failure or arrhythmia (mean IPSS: 6.1 and 5.9, respectively). Significant associations were found between LUTS severity and age ($p < 0.001$), hypertension ($p = 0.02$), and diabetes mellitus ($p = 0.03$). No significant gender differences were observed.

Conclusions: LUTS are highly prevalent in patients with CVD, with severity correlating positively with age and metabolic comorbidities. The findings underscore the need for integrated cardiovascular and urological care to improve patient outcomes.

Key Words: Lower Urinary Tract Symptoms, Cardiovascular Diseases, International Prostate Symptoms Score, Hypertension, Diabetes Mellitus

Introduction:

Cardiovascular diseases (CVD) remain the leading cause of morbidity and mortality worldwide, imposing significant economic and health burdens on societies[1]. Risk assessment and management strategies have primarily focused on traditional factors such as hypertension, diabetes, and hyperlipidemia[2]. However, the potential interplay between CVD and other chronic conditions, such as lower urinary tract symptoms (LUTS), has gained increasing attention in recent years[3].

LUTS encompass a range of symptoms related to storage, voiding, and post-micturition functions of the lower urinary tract. These symptoms are prevalent in aging populations and substantially affect quality of life[4]. Historically, LUTS were primarily linked to urological conditions, such as benign prostatic hyperplasia (BPH) in men and hormonal changes in women. However, emerging evidence highlights the shared pathophysiological mechanisms between LUTS and systemic conditions, including CVD[5]. Factors such as chronic inflammation, endothelial dysfunction, metabolic syndrome, and pelvic ischemia have been implicated in the development and progression of both conditions.

Epidemiological studies have demonstrated a bidirectional relationship between LUTS and CVD. Patients with LUTS are often found to have a higher prevalence of cardiovascular risk factors, such as hypertension and diabetes[6]. Conversely, individuals with CVD frequently report LUTS, with the severity of symptoms correlating with the extent of cardiovascular dysfunction[7]. These observations underscore the importance of recognizing LUTS as a potential marker of systemic vascular health[8]. Despite growing interest in this field, data on the prevalence and clinical correlation of LUTS in patients with established cardiovascular diseases remain limited, particularly in the Indian context[9]. Understanding these associations is crucial for developing integrated care models that address both cardiovascular and urological health.

This study aims to quantify the prevalence of LUTS among patients with CVD and explore clinical correlations with demographic and metabolic factors. By identifying key predictors and patterns, this research seeks to inform holistic approaches to managing these interconnected conditions.

Material and Methods:

This cross-sectional observational study was conducted over One year at a tertiary care center, with approval from the institutional ethics committee. A total of 160 patients aged 50 years or older were recruited, all of whom were hospitalized for cardiovascular conditions, including coronary artery disease, heart failure, and arrhythmia. Exclusion criteria included active genitourinary infections, a history of urological malignancy or pelvic surgery, and cognitive impairment that could affect questionnaire responses.

Demographic and clinical data, such as age, gender, body mass index (BMI), and comorbidities like hypertension and diabetes, were collected. The International Prostate Symptoms Score (IPSS) was used to evaluate LUTS severity, categorizing scores as mild (1-7), moderate (8-19), or severe (20-35). Statistical analysis was performed using SPSS version 26. Continuous variables were presented as means and standard deviations, while categorical variables were reported as frequencies and percentages. Comparisons between groups were conducted using chi-square tests for categorical data and ANOVA for continuous data. A p-value of less than 0.05 was considered statistically significant.

Results:

The study cohort consisted of 160 patients with a mean age of 63.7 ± 10.9 years. The majority were male (66.3%), and a significant proportion had hypertension (68.1%) or diabetes mellitus (35.6%). The prevalence of coronary artery disease was 73.8%, with smaller percentages diagnosed with heart failure (21.3%) and arrhythmia (14.9%). (Table1)

Moderate to severe LUTS was observed in 38.1% of participants. Specifically, 19.4% reported no symptoms, 48.8% had mild symptoms, 31.3% experienced moderate symptoms, and 6.8% had severe symptoms. Storage symptoms, such as nocturia and urgency, were the most frequently reported, affecting 72.5% of participants, followed by voiding symptoms (53.1%). (Table2)

Patients with moderate and severe LUTS were older, with mean ages of 65.8 ± 9.5 years and 70.4 ± 7.8 years, respectively, compared to 60.2 ± 11.1 years in those with mild LUTS. Hypertension was present in 74.5% of patients with moderate LUTS and 81.8% of those with severe LUTS. Similarly, diabetes was more common in patients with moderate to severe LUTS (42.0% and 45.5%, respectively) compared to those with mild or no symptoms (30.8%). (Table3)

Coronary artery disease was also associated with LUTS severity, being present in 76.0% of patients with moderate LUTS and 85.0% with severe LUTS, compared to 68.0% in those with mild symptoms.

These findings suggest a significant correlation between LUTS severity and age, hypertension, diabetes, and coronary artery disease (all $p < 0.05$).

Table 1: Demographic and clinical characteristics of the study populations

Parameter	Value (Mean ± SD or %)
Age (years)	63.7 ± 10.9
Gender (Male/Female)	66.3% / 33.7%
BMI (kg/m²)	28.6 ± 4.7
Hypertension	68.1%
Diabetes Mellitus	35.6%
Coronary Artery Disease	73.8%
Heart Failure	21.3%
Arrhythmia	14.9%

Table 2: Prevalence and severity of LUTS

LUTS Severity	Number of Patients (%)
None	31 (19.4%)
Mild	78 (48.8%)
Moderate	50 (31.3%)
Severe	11 (6.8%)

Table 3: Prevalence and severity of LUTS

Parameter	Mild (n=78)	Moderate (n=50)	Severe (n=11)	P-Value
Age (years)	60.2± 11.1	65.8 ± 9.5	70.4 ± 7.8	<0.001
Hypertension (%)	63.2%	74.5%	81.8%	0.02
Diabetes Mellitus (%)	30.8%	42.0%	45.5%	0.03
Coronary Artery Disease (%)	68.0%	76.0%	85.0%	0.01

Discussion:

The findings of this study align with prior research highlighting a high prevalence of LUTS among patients with cardiovascular diseases. Our study reported a 38.1% prevalence of moderate to severe LUTS, which is comparable to the 37.3% prevalence observed in the study by Semczuk-Kaczmarek et al. (2021)[10], focusing on hospitalized patients with CVD. Both studies emphasize the significant burden of LUTS in individuals with coronary artery disease, with our findings showing a higher mean IPSS score among these patients compared to those with heart failure or arrhythmia.

Additionally, our results corroborate the findings by Gacci et al. (2016)[1], who reported a strong association between LUTS severity and traditional cardiovascular risk factors, including hypertension and diabetes. Similar to their systematic review, our study observed that 74.5% of patients with moderate LUTS and 81.8% with severe LUTS had hypertension, underscoring the interplay between metabolic disorders and LUTS pathophysiology.

The relationship between LUTS and aging has been consistently documented in the literature. Our study revealed that the mean age increased significantly with LUTS severity, aligning with the observations by Lee et al. (2018)[3], who demonstrated an age-related increase in LUTS prevalence and severity among men with intermediate to high cardiovascular risk scores.

A notable difference in our study was the emphasis on storage symptoms, such as nocturia and urgency, which affected 72.5% of participants. This is consistent with the findings of Kim et al. (2010)[5], who identified storage symptoms as the predominant complaint in older adults with LUTS. However, the prevalence of voiding symptoms in our cohort was slightly lower compared to other studies, possibly reflecting demographic or healthcare access differences.

Overall, our findings reinforce the importance of considering LUTS as a potential marker for cardiovascular health, advocating for integrated care models that address both conditions. Future studies should explore the mechanistic links, particularly the role of chronic inflammation, endothelial dysfunction, and pelvic ischemia in the shared pathophysiology of LUTS and CVD.

Conclusion:

LUTS are prevalent in patients with cardiovascular diseases, with severity influenced by age, hypertension, and diabetes. Integrative care approaches are essential to address the overlapping pathophysiology and improve patient outcomes.

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