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A Hospital-Based Observational Study on the Pattern of Lower Urinary Tract Symptoms and Their Associated Risk Factors in Adult Patients Attending a Urology Department

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Abstract

Background: Lower urinary tract symptoms are common in adult urology practice and represent a heterogeneous cluster of storage, voiding, and post-micturition complaints. Their symptom burden rises with age and is influenced by metabolic, infective, and outlet-related factors.

Objectives: To describe the pattern of lower urinary tract symptoms and to identify the major associated risk factors among adult patients attending a tertiary care urology department. ***Methods:*** This hospital-based observational study included 100 consecutive adults with lower urinary tract symptoms evaluated in the Department of Urology at RVM Institute of Medical Sciences and Research Centre, Laxmakkapally, Telangana, India, from October 2023 to May 2024. Demographic details, symptom profile, duration, severity, associated comorbidities, and clinical etiologies were recorded in a structured proforma and analyzed using descriptive statistics. ***Results:*** Patients were predominantly male (68%) and the mean age was 54.8 ± 13.6 years. The largest age group was 51-60 years (28%). Increased urinary frequency (72%), nocturia (65%), and urgency (58%) were the leading symptoms, indicating predominance of storage complaints. Moderate symptoms were present in 49% and severe symptoms in 30%. Benign prostatic hyperplasia was the commonest etiology (35%), followed by urinary tract infection (18%) and overactive bladder (16%). Age >50 years (62%), benign prostatic enlargement (37%), diabetes mellitus (34%), smoking (31%), and hypertension (29%) were the leading associated factors. ***Conclusion:*** Lower urinary tract symptoms in this tertiary care cohort were more frequent in middle-aged and elderly adults, with a marked male predominance. Storage symptoms formed the dominant clinical pattern, and benign prostatic hyperplasia remained the principal etiology. Increasing age and metabolic comorbidities were strongly associated with symptom burden, underscoring the need for early evaluation and risk-factor-oriented management.

Keywords: *lower urinary tract symptoms; benign prostatic hyperplasia; nocturia; overactive bladder; risk factors; urology*

Introduction

Lower urinary tract symptoms (LUTS) comprise a spectrum of storage, voiding, and post-micturition complaints that arise from disorders affecting the bladder, prostate, urethra, pelvic floor, or nervous system. These symptoms include urinary frequency, urgency, nocturia, weak stream, hesitancy, intermittency, incomplete emptying, and post-void dribbling. Rather than representing a single disease entity, LUTS reflect the final clinical expression of multiple underlying pathophysiological processes, including benign prostatic enlargement, bladder outlet obstruction, overactive bladder, urinary tract infection, neurogenic dysfunction, and metabolic disorders [1-4].

The public health burden of LUTS is substantial. Large population studies from different regions have shown that urinary symptoms are highly prevalent in both men and women and increase steadily with advancing age [1,2,5,6]. Storage symptoms are often reported more frequently than voiding symptoms, and nocturia remains one of the most common and bothersome manifestations across age groups [3,7]. Beyond symptom distress, LUTS can disrupt sleep, impair work performance, reduce sexual well-being, and diminish overall quality of life. Despite this burden, many affected individuals delay medical consultation, leading to persistent symptoms and progression of underlying disease [1,6]. Ageing is the strongest non-modifiable determinant of LUTS; however, a wide range of associated factors have also been described. Diabetes mellitus, hypertension, obesity, smoking, alcohol intake, dyslipidemia, and other features of the metabolic syndrome have all been linked to higher symptom prevalence or severity [3,8-10]. In men, benign prostatic hyperplasia (BPH) is a major contributor to bothersome LUTS and is frequently encountered in routine urological practice [10-13]. In women, recurrent urinary tract infection, pelvic floor dysfunction, childbirth-related factors, and voiding postponement behaviors can shape symptom patterns [4,14]. This multifactorial background highlights the need to examine LUTS not only as a symptom complex but also as a marker of associated clinical risk.

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Current guidelines emphasize careful clinical assessment, symptom characterization, identification of red-flag features, and evaluation of modifiable risk factors before treatment planning [11-13]. In resource-variable tertiary care settings, a pragmatic understanding of the local clinical profile remains particularly valuable. Hospital-based observational studies can provide actionable information on symptom distribution, etiological patterns, and associated comorbidities among patients who actually seek specialist care. Such information supports more focused diagnostic work-up and helps prioritize preventive and therapeutic strategies.

Against this background, the present study was undertaken to assess the pattern of lower urinary tract symptoms among adult patients attending the urology department of a tertiary care teaching hospital and to identify the major associated risk factors and etiological categories in this patient population.

Materials and Methods

Study design and setting

This hospital-based observational study was conducted at RVM Institute of Medical Sciences and Research Centre, Laxmakkapally, Telangana, India, a tertiary care teaching hospital. The study was carried out over eight months, from October 2023 to May 2024, in the Department of Urology.

Study population and sample size

Adult patients attending the urology outpatient department or referred for evaluation of lower urinary tract symptoms during the study period were screened for eligibility. A total of 100 consecutive patients meeting the study criteria were included. The sample represented routine specialist-care attendees with symptomatic LUTS and was adequate for descriptive analysis of symptom pattern and associated factors in the institutional setting.

Eligibility criteria

Adults aged 18 years and above presenting with one or more lower urinary tract symptoms, including storage, voiding, or post-micturition complaints, were included. Patients unwilling to participate, those with acute critical illness requiring immediate emergency intervention, those with previously treated major urological malignancy, and those with incomplete clinical records were excluded from analysis.

Data collection procedure

After clinical evaluation, data were entered into a structured case record proforma. The variables documented included age, sex, duration of symptoms, predominant symptom type, severity of symptoms, relevant comorbid conditions, lifestyle factors, and provisional etiological diagnosis based on routine clinical assessment. Particular attention was paid to common LUTS such as increased frequency, nocturia, urgency, poor stream, dysuria, hesitancy, intermittency, straining, incomplete emptying, and post-void dribbling. Symptom burden was categorized into mild, moderate, and severe groups according to standard symptom-based clinical assessment followed in the department. Etiological grouping included benign prostatic hyperplasia, urinary tract infection, overactive bladder, urethral stricture, bladder outlet obstruction, neurogenic bladder, diabetic cystopathy, and other less frequent causes.

Study variables

The primary outcome variables were the distribution of specific LUTS, predominant symptom pattern, and symptom severity. Secondary variables included demographic profile, duration of symptoms, etiological diagnosis, and associated risk factors such as age above 50 years, diabetes mellitus, hypertension, smoking, alcohol consumption, obesity, recurrent urinary tract infection, benign prostatic enlargement, history of catheterization, and neurological disorders.

Statistical analysis

The collected data were entered into a spreadsheet and analyzed using descriptive statistical methods. Categorical variables were expressed as frequencies and percentages, while continuous variables were summarized as mean and standard deviation wherever applicable. Cross-tabulation was used to examine age distribution, symptom categories, etiological pattern, and associated risk factors. The findings were presented in tabular form for journal reporting.

Ethical considerations

The study was conducted in accordance with institutional ethical standards for observational clinical research. Patient confidentiality was maintained throughout data collection and analysis, and personal identifiers were excluded from the final dataset used for manuscript preparation.

Results

A total of 100 adult patients presenting with lower urinary tract symptoms were included in the present study. Demographic profile, symptom pattern, severity, etiology, and associated risk factors were analyzed in detail. The study population showed a clear male predominance and was largely concentrated in the middle-aged and elderly groups.

As shown in Table 1, 68% of the patients were males and 32% were females, yielding a male-to-female ratio of 2.1:1. The age ranged from 21 to 82 years, with a mean age of 54.8 ± 13.6 years. The 51-60 years age group constituted the largest proportion of cases (28%), followed by the 61-70 years group (22%).

Table 1. Demographic characteristics of study participants

Variable	Number (n=100)	Percentage (%)
Age group (years)		
21-30	8	8.0
31-40	12	12.0
41-50	18	18.0
51-60	28	28.0
61-70	22	22.0
>70	12	12.0
Sex		
Male	68	68.0

Variable	Number (n=100)	Percentage (%)
Female	32	32.0

The distribution of individual lower urinary tract symptoms is summarized in Table 2. Increased urinary frequency was the most common presenting complaint, reported by 72% of patients, followed by nocturia in 65% and urgency in 58%. Among voiding symptoms, poor urinary stream was present in 46%, incomplete emptying in 44%, and dysuria in 41% of patients. Overall, storage symptoms were more frequent than voiding and post-micturition complaints.

Table 2. Distribution of lower urinary tract symptoms

Symptom	Number	Percentage (%)
Increased frequency	72	72.0
Nocturia	65	65.0
Urgency	58	58.0
Dysuria	41	41.0
Poor stream	46	46.0
Hesitancy	38	38.0
Straining	29	29.0
Intermittency	33	33.0
Incomplete emptying	44	44.0
Post-void dribbling	27	27.0

When grouped according to predominant symptom type, storage symptoms formed the leading clinical pattern. As detailed in Table 3, 39% of patients had predominantly storage symptoms, 24% had mainly voiding symptoms, 9% had post-micturition symptoms, and 28% had mixed symptoms. In the same table, symptom severity assessment revealed that moderate LUTS formed the largest subgroup (49%), whereas severe symptoms were present in 30% and mild symptoms in 21% of cases.

Table 3. Pattern and severity of LUTS

Parameter	Number	Percentage (%)
Predominant symptom pattern		
Storage symptoms	39	39.0
Voiding symptoms	24	24.0
Post-micturition symptoms	9	9.0
Mixed symptoms	28	28.0
Severity of LUTS		
Mild	21	21.0
Moderate	49	49.0
Severe	30	30.0

The etiological profile of LUTS in the study population is shown in Table 4. Benign prostatic hyperplasia was the commonest identified etiology, accounting for 35% of cases, particularly among older men. Urinary tract infection and overactive bladder constituted 18% and 16% of cases, respectively. Urethral stricture, bladder outlet obstruction unrelated to BPH, neurogenic bladder, and diabetic cystopathy contributed smaller but clinically relevant proportions.

Table 4. Etiological distribution of LUTS

Etiology	Number	Percentage (%)
Benign prostatic hyperplasia	35	35.0
Urinary tract infection	18	18.0
Overactive bladder	16	16.0
Urethral stricture	9	9.0
Bladder outlet obstruction (non-BPH)	7	7.0
Neurogenic bladder	6	6.0
Diabetic cystopathy	5	5.0
Others	4	4.0

Table 5 presents the distribution of associated risk factors. Age above 50 years was the most frequent associated factor, observed in 62% of patients. Benign prostatic enlargement was noted in 37%, diabetes mellitus in 34%, smoking in 31%, and hypertension in 29%. Obesity, recurrent urinary tract infection, and alcohol consumption were also common. These findings suggest that LUTS in this cohort occurred in a

clinically complex setting with a substantial burden of metabolic, infective, and outlet-related contributors.

Table 5. Associated risk factors among patients with LUTS

Risk factor	Number	Percentage (%)
Age >50 years	62	62.0
Diabetes mellitus	34	34.0
Hypertension	29	29.0
Smoking	31	31.0
Alcohol consumption	22	22.0
Obesity (BMI >=25 kg/m²)	27	27.0
Recurrent urinary tract infection	26	26.0
Benign prostatic enlargement	37	37.0
History of catheterization	11	11.0
Neurological disorders	8	8.0

Overall, the results indicate that LUTS in adults attending this tertiary care urology department were characterized by male predominance, increasing occurrence with age, dominance of storage symptoms, and a major contribution from BPH and metabolic comorbidities. The data also highlight that multiple associated factors coexist in a considerable proportion of symptomatic patients, reinforcing the need for comprehensive evaluation in routine practice.

Discussion

The present hospital-based observational study demonstrated that LUTS in adults attending a tertiary care urology service were predominantly seen in middle-aged and elderly individuals, with a clear male predominance. This demographic profile is consistent with previous epidemiological investigations showing that LUTS increase steadily with age and that men frequently present to specialist services with outlet-related complaints linked to prostatic enlargement [1,2,6,10]. Although LUTS are highly prevalent in both sexes in community studies, the higher proportion of men in the present cohort likely reflects referral bias toward a urology clinic, where BPH-related symptoms form a major part of clinical practice [10-13].

Storage symptoms dominated the clinical picture in the present study. Increased urinary frequency, nocturia, and urgency were the leading complaints, whereas poor stream and incomplete emptying were the most common voiding symptoms. This pattern broadly parallels published population data in which storage symptoms are often more prevalent than voiding or post-micturition symptoms [1,3,5,6]. The prominence of nocturia and urgency in our patients is particularly notable because these symptoms substantially impair sleep, daily functioning, and quality of life [3,7]. The finding that moderate symptoms constituted the largest category in our series suggests that many patients seek specialist evaluation only after symptom persistence or functional disruption becomes clinically significant.

Benign prostatic hyperplasia was the commonest etiological diagnosis in this study, followed by urinary tract infection and overactive bladder. This observation is expected in a tertiary urology setting and agrees with the established role of BPH as a major contributor to bothersome LUTS among ageing men [10-13]. At the same time, the presence of urinary tract infection, overactive bladder, urethral stricture, neurogenic bladder, and diabetic cystopathy in meaningful proportions underscores the heterogeneous nature of LUTS. Guidelines consistently stress that LUTS should not be equated with BPH alone and that careful clinical evaluation is necessary before therapeutic decisions are made [11-13].

The associated risk-factor profile in the present study further emphasizes the multifactorial basis of LUTS. Age above 50 years was the most frequent associated factor, followed by benign prostatic enlargement, diabetes mellitus, smoking, hypertension, and obesity. These observations are well aligned with previous literature linking LUTS with advancing age, metabolic derangements, and adverse lifestyle exposures [3,8,9]. Community-based surveys have shown positive associations of LUTS with smoking, alcohol use, diabetes, and hypertension, while review data also support roles for obesity, dyslipidemia, and components of metabolic syndrome [3,8,9]. The relatively high burden of diabetes and hypertension in our cohort is clinically relevant because autonomic dysfunction, chronic inflammation, microvascular disease, and altered bladder function may all amplify urinary symptoms in such patients [8,9].

The findings of the present study therefore support a practical clinical message: patients presenting with LUTS require broad evaluation rather than a symptom-only approach. In a tertiary care setting, symptom characterization should be integrated with assessment of comorbid disease, infection risk, and possible outlet obstruction. The current results contribute institution-level evidence from Telangana and are useful for understanding the pattern of LUTS among adults who actually seek urological care.

Limitations

This was a single-center hospital-based observational study with a relatively modest sample size of 100 patients, which restricts external generalizability. The study population represented treatment-seeking adults attending a tertiary care department and therefore did not reflect community prevalence. Symptom severity categories were derived from routine clinical assessment, and detailed uroflowmetric, urodynamic, or follow-up outcome correlations were not incorporated into the present analysis.

Conclusion

Lower urinary tract symptoms in this tertiary care cohort were most frequently observed in middle-aged and elderly adults and showed a marked male predominance. Storage symptoms, particularly frequency, nocturia, and urgency, formed the dominant clinical pattern. Benign prostatic hyperplasia emerged as the leading etiology, while urinary tract infection and overactive bladder were also important contributors. Advancing age, benign prostatic enlargement, diabetes mellitus, smoking, hypertension, and obesity were common associated factors. These findings highlight the need for comprehensive, risk-factor-oriented evaluation of adults presenting with LUTS so that underlying causes can be identified early and appropriately managed in routine urological practice.

References

1. Coyne KS, Sexton CC, Thompson CL, Milsom I, Irwin D, Kopp ZS, et al. The prevalence of lower urinary tract symptoms (LUTS) in the USA, the UK and Sweden: results from the Epidemiology of LUTS (EpiLUTS) study. BJU Int. 2009;104(3):352-60. doi:10.1111/j.1464-410X.2009.08427.x.

2. Coyne KS, Sexton CC, Bell JA, Thompson CL, Dmochowski R, Bavendam T, et al. The prevalence of lower urinary tract symptoms (LUTS) and overactive bladder (OAB) by racial/ethnic group and age: results from OAB-POLL. Neurourol Urodyn. 2013;32(3):230-7. doi:10.1002/nau.22295.
3. Wang Y, Hu H, Xu K, Wang X, Na Y, Kang X. Prevalence, risk factors and the bother of lower urinary tract symptoms in China: a population-based survey. Int Urogynecol J. 2015;26(6):911-9. doi:10.1007/s00192-015-2626-8.
4. Zhang L, Zhu L, Xu T, Lang J, Li Z, Gong J, et al. A population-based survey of the prevalence, potential risk factors, and symptom-specific bother of lower urinary tract symptoms in adult Chinese women. Eur Urol. 2015;68(1):97-112. doi:10.1016/j.eururo.2014.12.012.
5. Moreira ED Jr, Neves RCS, Fernandes Neto A, Duarte FG, Moreira TL, Lobo CFL, et al. A population-based survey of lower urinary tract symptoms (LUTS) and symptom-specific bother: results from the Brazilian LUTS epidemiology study (BLUES). World J Urol. 2013;31(6):1451-8. doi:10.1007/s00345-013-1057-8.
6. Wang JY, Liao L, Liu M, Sumarsono B, Cong M. Epidemiology of lower urinary tract symptoms in a cross-sectional, population-based study: The status in China. Medicine (Baltimore). 2018;97(34):e11554. doi:10.1097/MD.0000000000011554.
7. Madhu C, Coyne K, Hashim H, Kopp Z, Chapple C. Nocturia: risk factors and associated comorbidities; findings from the EpiLUTS study. Int J Clin Pract. 2015;69(12):1508-16. doi:10.1111/ijcp.12727.
8. Parsons JK. Modifiable risk factors for benign prostatic hyperplasia and lower urinary tract symptoms: new approaches to old problems. J Urol. 2007;178(2):395-401. doi:10.1016/j.juro.2007.03.103.
9. Calogero AE, Burgio G, Condorelli RA, Cannarella R, La Vignera S. Epidemiology and risk factors of lower urinary tract symptoms/benign prostatic hyperplasia and erectile dysfunction. Aging Male. 2019;22(1):12-19. doi:10.1080/13685538.2018.1434772.
10. Tomita K, Mizoue T, Matsumoto T. Lower urinary tract symptoms in relation to lifestyle and medical conditions in Japanese workers. Int J Urol. 2009;16(5):493-8. doi:10.1111/j.1442-2042.2009.02276.x.
11. Roehrborn CG. Male lower urinary tract symptoms (LUTS) and benign prostatic hyperplasia (BPH). Med Clin North Am. 2011;95(1):87-100. doi:10.1016/j.mcna.2010.08.013.
12. Lerner LB, McVary KT, Barry MJ, Bixler BR, Dahm P, Das AK, et al. Management of lower urinary tract symptoms attributed to benign prostatic hyperplasia: AUA guideline part I-initial work-up and medical management. J Urol. 2021;206(4):806-817. doi:10.1097/JU.0000000000002183.
13. Lightner DJ, Gomelsky A, Souter L, Vasavada SP. Diagnosis and treatment of overactive bladder (non-neurogenic) in adults: AUA/SUFU guideline amendment 2019. J Urol. 2019;202(3):558-563. doi:10.1097/JU.0000000000000309.
14. Homma Y, Gotoh M, Kawauchi A, Kojima Y, Masumori N, Nagai A, et al. Clinical guidelines for male lower urinary tract symptoms and benign prostatic hyperplasia. Int J Urol. 2017;24(10):716-729. doi:10.1111/iju.13401.