The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 5, 2025

FACTORS AFFECTING RECURRENT UTIS IN POST-MENOPAUSAL WOMAN-A SINGLE CENTER, TERTIARY CARE STUDY

Adnan Khan[*1], Durre Shohab[2], Sajeela Bano[3], Behzad Khan Khalil[4], Husnain Hamza[5], Saeed Akhtar[6]

*[*1,3]MBBS, FCPS General Surgery, PG Urology Department of Renal Transplant Surgery & Urology PAF Hospital E-9, Islamabad*
[2]MBBS, FCPS Urology, Consultant Urology Department of Renal Transplant Surgery & Urology PAF Hospital E-9, Islamabad
[4]MBBS, MO Urology Department of Renal Transplant Surgery & Urology PAF Hospital E-9, Islamabad
[5]MBBS, PG Urology Department of Renal Transplant Surgery & Urology PAF Hospital E-9, Islamabad
[6]MBBS, MD American Diplomat, Professor and HOD of Department of Renal Transplant Surgery & Urology PAF Hospital E-9, Islamabad

[*1]adnan_amc1@yahoo.com

DOI: https://doi.org/10.5281/zenodo.15401102

Keywords
Recurrent urinary tract infections, Postmenopausal women, Genitourinary instrumentation, Risk factors, Hormone replacement therapy, Diabetes mellitus

Article History
Received on 05 April 2025
Accepted on 05 May 2025
Published on 14 May 2025

Corresponding Author: * **Adnan Khan**

Abstract

Background: *Recurrent urinary tract infections (UTIs) are a common urological concern among postmenopausal women. Identifying risk factors associated with recurrent UTIs can help guide preventive strategies and tailored management.*

Objective: *To evaluate the frequency of recurrent UTIs in postmenopausal women and compare associated risk factors including age, duration of menopause, diabetes, hormone replacement therapy (HRT) use, genitourinary (GU) instrumentation, and body mass index (BMI).*

Study Design and Setting: *This prospective observational study was conducted at the Department of Renal Transplant Surgery & Urology, PAF Hospital E-9, Islamabad from 25-11-2024 to 25-04-2025.*

Methodology: *Postmenopausal women presenting with urological complaints were enrolled. Patients with anatomical abnormalities, genitourinary fistulas, malignancies, or stones were excluded. Data collected included age, duration of menopause, diabetes, HRT usage, BMI, and history of GU instrumentation. Patients were categorized into two groups: Group A (with recurrent UTIs) and Group B (without). Statistical analysis was performed using SPSS version 23. Chi-square and t-tests were used, with $p < 0.05$ considered significant.*

Results: *A total of 135 women were included, with a mean age of 62.63 ± 13.45 years. Recurrent UTIs were present in 45 (33.3%). GU instrumentation was significantly more frequent in Group A (62.2%) compared to Group B (32.2%) ($p = 0.00$). No significant differences were observed in age, menopause duration, diabetes, HRT use, or BMI between groups.*

Conclusion: *GU instrumentation is significantly associated with recurrent UTIs in postmenopausal women. Other factors such as age, diabetes, and HRT use showed no significant association.*

INTRODUCTION

Urinary tract infections (UTIs) in women are one of the most common cause of ailment both in pre and post-menopausal period [1]. UTIs are believed to affect up to 50% of women above the age of 50 years [2]. Diabetes, limited mobility, sexual intercourse, past history of urogynecological surgery, poor bladder emptying, accidental bowel leakage, and urinary incontinence are few of the known risk factors for recurrent UTIs [3]. Symptoms and signs of the genitourinary syndrome of menopause (GSM) often accompany the UTIs in postmenopausal women [4]. GSM, which was previously called as vulvovaginal atrophy, atrophic vaginitis, or urogenital atrophy describes the variety of changes caused by the deficiency of estrogens during menopause [5]. This increases the risk of UTIs in Post-menopausal women. Pattern and burden of UTIs is not universal across the globe both in younger and older population and is affected by multiple factors. Hua Deng et al found substantial heterogeneities in frequency and pattern of UTIs across countries, sex, and age groups [6].

Pakistan is a large and diverse country with population having wide diversity with respect to education, culture, rural and urban distribution, socioeconomic status etc .So far we lack any data narrating the burden, pattern and risk factors for UTIs in Pakistani women so as to compare our disease dynamics with rest of the world. We have therefore evaluated the various factor effecting the frequency and pattern of UTIs in post-menopausal Pakistani patients presenting to private sector tertiary care setup. This may be a small step towards collection of disease specific data helping us to understand and manage our own disease dynamics and will help us to devise the ways to prevent and treat this condition.

PATIENTS AND METHODS:

The prospective observational study was conducted in Department of Renal Transplant Surgery & Urology, PAF Hospital E-9, Islamabad from 25 -11-2024 to 25-04-2025. informed consent and due approval from institutional IRB. All post-menopausal females presenting in department of Urology and Transplant Surgery, PAF Hospital with any Urological complains were included in study. Patients with anatomical abnormalities, Genitourinary Fistulas, Renal or bladder stones and genitourinary malignancy were excluded from study. Menopause was defined as absence of menstruation for minimal of 12 mo nths without any hormonal manipulation. Recurrent UTIs were defined as minimum of two episodes of culture positive UTIs in 06 months or 03 episodes in 01 year during past 05 years[7]. GU instrumentation is defined as any urological procedure like catheterization, urethral dilatation or surgery like Bladder biopsy, Urterorenoscopy or double JJ stenting in past 02 years.

Data regarding patient age, duration of menopause, GU instrumentation, Diabetes, usage of Hormone replacement therapy (HRT) was collected during history taking and collected on specified proforma . Patients were divided into two groups for data analysis. Those with recurrent UTIs were included in group-A while those with no history recurrent UTIs were included in group-B. Both groups were compared for above mentioned variables. SPSS ver-23 was used for analysis. Frequency percentage was calculated for qualitative variable including usage of HRT, diabetes and duration of menopause while Mean ± SD was calculated for quantitative variables like age and duration of menopause. Chi square test was applied for comparison of qualitative variables while Student t-test was used for quantitative variables. P-value of <0.05 was considered significant.

Results:

A total of 135 patients with mean age of 62.63 ± 13.45 years were included in study. Overall 45 (33.3%) out of 135 patients had history of recurrent UTIs. Fifty eight (43%) patients has diabetes, 53 patients (39.9%) had history of GU instrumentation, and 13 (9.6%) patients used HRT while mean BMI of patients was 27.51±5.38.

In group- A the mean age of patients was 64.35 ± 13.01 Years versus 61.77 ± 13.66 Years in group-B (p-value -0.2953).Mean Duration of menopause in group-A was19.73 ± 10.83 Years compared to in group-B was16.87 ± 10.28 Years (p-value -0.1368).Nineteen patients(42.2%) had diabetes in group-A versus 39 patients (43.3%) in group-B (p-value -0.9025) while 05 (11.1%) patients in group-A

used HRT compared to 08 (8.9%) in group-B (p-value -0.6801). In group-A 28 (62.2%) patients had H/O GU instrumentation compared to 29(32.2%) in group-B (p-value -0.0009). BMI in group-A was27.32 ± 5.71 compared to 27.68 ± 5.14 in group-B (p-value 0.7123).

Table 1: Overall Patient Characteristics (n = 135)

Variable	Frequency (%)
Mean Age (years)	62.63 ± 13.45
Patients with Recurrent UTIs	45 (33.3%)
Diabetes Mellitus	58 (43.0%)
History of GU Instrumentation	53 (39.9%)
Use of HRT	13 (9.6%)
Mean BMI (kg/m²)	27.51 ± 5.38

Table 2: Comparison Between Group-A (Recurrent UTIs) and Group-B (No Recurrent UTIs)

Variable	Group-A (n = 45)	Group-B (n = 90)	p-value
Mean Age (years)	64.35 ± 13.01	61.77 ± 13.66	0.30
Duration of Menopause (years)	19.73 ± 10.83	16.87 ± 10.28	0.14
Diabetes Mellitus	19 (42.2%)	39 (43.3%)	0.90
Use of HRT	5 (11.1%)	8 (8.9%)	0.68
History of GU Instrumentation	28 (62.2%)	29 (32.2%)	0.00
Mean BMI (kg/m²)	27.32 ± 5.71	27.68 ± 5.14	0.71

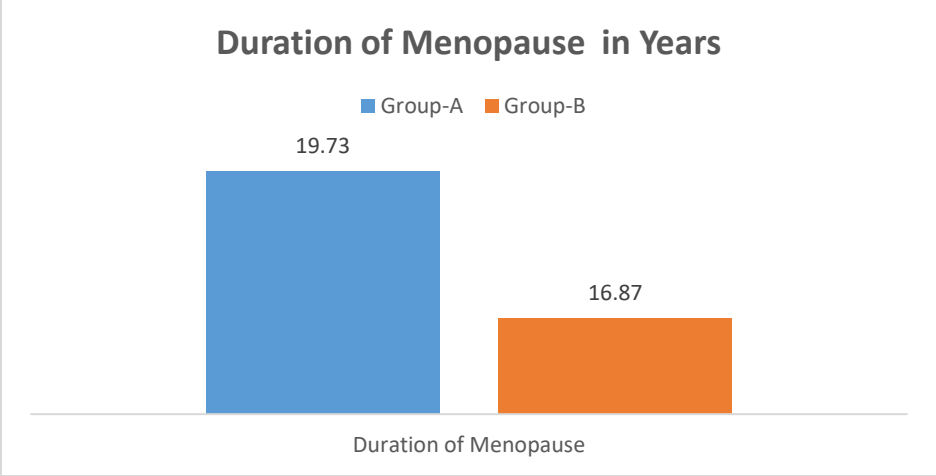

Figure: Comparison of duration of menopause Between Group-A (Recurrent UTIs) and Group-B (No Recurrent UTIs)

Discussion

UTIs are one of the most common infections in old age patients with more incidences of UTIs after menopause [8]. There are wide variation in frequency and prevalence of recurrent UTI with respect to age, geographical distribution, sexual practices and comorbids. Vazquez-Montes et al conducted a large study in UK to assess the epidemiology and risk

factors for recurrent UTI. In age group from 50-64 years the frequency of r-UTI was 18% compare to 45% in our population [7]. This difference may be attributed to difference in socioeconomic conditions, hygiene practices and availability of healthcare facilities. Similarly Luapland et al found frequency of r-UTI in Canadian woman to be 10.5%, much lower than our population [9].

Coming to risk factors, although diabetes is considered a well known risk factor for recurrent UTIs [2]. Stapleton A et al in a meta-analysis concluded the on the basis of different epidemiologic studies that bacteriuria and urinary tract infection (UTI) occur more commonly in women with diabetes than in women without this disease [10].However our study did not showed any difference in frequency of UTI with respect to diabetes(42.2% vs 43.3% , 0.9025). Smaller sample size and dealing with relatively affluent class may be the possible reason for that. Also our study lacked the check on diabetes control of patients.A lot of post-menopausal patients use HRT in form of local estrogen creams. Christmas MM et al found HRT to significantly lower the risks of r-UTIs [11].Also a Systematic Review done by David D Rahn et al showed moderate-quality evidence indicating a lower risk of UTIs with use of HRT [12]. This is again not consistent with our study showing no significant difference in frequency of UTIs in patients with or without HRT use. We can cite, inconsistent usage and smaller sample size, to be a possible explanation of this finding.

Coming to BMI, Habeeb Alhabeeb et al in there review article found BMI to be a significant risk factor for Urinary tract infections. There analysis showed a significantly high risk of UTI in patients having obesity vs. individuals without obesity (RR = 1.45; 95% CI: 1.28 - 1.63; I^2 = 94%) [13]. This is again in contrast to our findings. BMI in both of our groups faied to show any significant difference. One factor that was significantly more frequent in patients with recurrent UTIs was history of GU instrumentation in past two years (28 (62.2%) vs 29(32.2%) p-val -0.0009). On literature review, we found that this factor is not routinely taken into account. While indwelling catheter is a well-documented cause of UTI [14,15], Past history of instrumentation is not evaluated as a risk factor for recurrent UTIs.

Our study highlights differences of our population suffering from UTIs from rest of the globe. Also past history of GU instrumentation should be evaluated as a risk factor for UTIs. Our sample size was small and needs a repeat study with better design and bigger sample size.

CONCLUSION: -

GU instrumentation is the found to be the only statically significant risk factor for UTIs in post-menopausal women. There is no statistically significant difference with respect to diabetes, duration of menopause, HRT and BMI in post-menopausal woman, with or without History of recurrent UTIs.

REFERENCES-

1. Czajkowski K, Broś-Konopielko M, Teliga-Czajkowska J. Urinary tract infection in women. Prz Menopauzalny. 2021 Apr;20(1):40-47.
2. Jung C, Brubaker L. The etiology and management of recurrent urinary tract infections in postmenopausal women. Climacteric. 2019 Jun;22(3):242-249.
3. Mody L & Juthani-Mehta M Urinary tract infections in older women. JAMA J. Am. Med. Assoc 311, 844–854 (2014)
4. Caretto M, Giannini A, Russo E, Simoncini T. Preventing urinary tract infections after menopause without antibiotics. Maturitas. 2017 May;99:43-46.
5. Angelou K, Grigoriadis T, Diakosavvas M, Zacharakis D, Athanasiou S. The Genitourinary Syndrome of Menopause: An Overview of the Recent Data. Cureus. 2020 Apr 8;12(4)
6. Hua Deng, Yan Zhao, Qin Zou, Zhe Chen, Xiangping Liao,Global burden, trends, and cross-country inequalities of urinary tract infections in adolescents and young adults, 1990 to 2019,American Journal of Infection Control, Volume 52, Issue 10,2024,Pages 1176-1183

7. Vazquez-Montes MDLA, Fanshawe TR, Stoesser N, Walker AS, Butler C, Hayward G. Epidemiology and microbiology of recurrent UTI in women in the community in Oxfordshire, UK. JAC Antimicrob Resist. 2024 Jan 10;6(1)
8. Houston CG, Azar WS, Huang SS, Rubin R, Dorris CS, Sussman RD. A Cost Savings Analysis of Topical Estrogen Therapy in Urinary Tract Infection Prevention Among Postmenopausal Women. Urol Pract. 2024 Mar;11(2):257-266.
9. Laupland KB, Ross T, Pitout JDD et al. Community-onset urinary tract infections: a population-based assessment. Infection 2007; 35: 150–3. 10.1007/s15010-007-6180-2
10. Stapleton A. Urinary tract infections in patients with diabetes. Am J Med. 2002 Jul 8;113 Suppl 1A:80S-84S
11. Christmas MM, Iyer S, Daisy C, Maristany S, Letko J, Hickey M. Menopause hormone therapy and urinary symptoms: a systematic review. Menopause. 2023 Jun 1;30(6):672-685.
12. Rahn DD, Carberry C, Sanses TV, Mamik MM, Ward RM, Meriwether KV, Olivera CK, Abed H, Balk EM, Murphy M; Society of Gynecologic Surgeons Systematic Review Group. Vaginal estrogen for genitourinary syndrome of menopause: a systematic review. Obstet Gynecol. 2014 Dec;124(6):1147-1156.
13. Alhabeeb H, Baradwan S, Kord-Varkaneh H, Tan SC, Low TY, Alomar O, Salem H, Al-Badawi IA, Abu-Zaid A. Association between body mass index and urinary tract infection: a systematic review and meta-analysis of observational cohort studies. Eat Weight Disord. 2021 Oct;26(7):2117-2125.
14. Flores-Mireles AL, Walker JN, Caparon M, Hultgren SJ. Urinary tract infections: epidemiology, mechanisms of infection and treatment options. Nat Rev Microbiol. 2015 May;13(5):269-84
15. Papp SB, Christie AL, Zimmern PE. Characteristics of Nationwide Urinary Tract Infection (UTI) Visits by Age and Type II Diabetes Status in Women. Cureus. 2023 Sep 26;15(9).