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A PROSPECTIVE OBSERVATIONAL STUDY ON ASSESSMENT OF RISK FACTORS IN URINARY TRACT INFECTIONS IN POSTMENOPAUSAL WOMEN

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ABSTRACT

Background: Urinary tract infections (UTIs) are the most common bacterial infections in women, and increase incidence after menopause. It is important to uncover underlying abnormalities or modifiable risk factors. Objective: to assess the risk factors for urinary tract infections in postmenopausal women. Methods: In this prospective observational analysis, all postmenopausal patients presented with UTI in 6 months in Karuna Medical College Hospital, Vilayodi were included. Data regarding their demographics, past medical and medication history, signs and symptoms and laboratory data obtained from all patients. The collected data was compiled and data analysis was performed. Results: Out of 66 patients enrolled in the study, diabetes (48.48%) was found to be the major risk factor. Hypertension (42.42%), decreased water intake (37.87%), history of premenopausal UTI (34.84%), wiping wrong way after toilet use (30.30%), use of indwelling catheter (25.75%), holding urine (22.72%), nosocomial infections (19.69%), and urinary incontinence (18.18%) are found to be some of the predisposing factors for UTI in postmenopausal women. Conclusion: there are several risk factor for UTI in postmenopausal women and the leading cause was found to be diseases like diabetes, hypertension and behavioural features like holding urine, wiping the wrong way, decreased water intake, other structural and anatomical risk factors like atrophic vaginitis, cystocele, urolithiasis and uterine prolapse..

Key words Postmenopausal UTI, Nosocomial infections, vaginal atrophy, indwelling catheter, Risk factors.

INTRODUCTION

Urinary tract infections (UTIs) are among the most common bacterial infections in humans. It is estimated that 40% of women and 12% of men experience a minimum of one symptomatic UTI episode during their lifetime, and 27 to 48% of the affected women suffer from recurrent UTIs. UTIs comprise about 40% of all nosocomial infections and 50% of bacterial infections that contribute to increased morbidity leading to prolonged hospitalization.[1] LUTSs have negative effects on women's quality of life, especially on the medical, physical, social, psychological, economic, and sexual aspects.[2]Menopause is associated with a marked reduction in endogenous estrogen production, Lower levels of circulating blood estrogen have various deleterious effects in the body, including those on the lower urinary tract. The vaginal epithelium becomes atrophied and dry, which can cause vaginal discomfort, itching, and dyspareunia. The epithelium may become inflamed and contribute to several urinary symptoms.[3] The factors predisposing Postmenopausal women for UTI are the anatomical and physiological abnormalities, such as cystocele, incontinence, incomplete bladder emptying, and estrogen deficiency, compared with premenopausal women.[4].

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In postmenopausal women, lack of estrogen appears to be an important factor predisposing them to recurrent UTI, as does nonsecretor status, a history of UTI in the premenopausal period, urinary incontinence, presence of a cystocele, and post void residual urine. In older women who are institutionalized, catheterization, incontinence, microbial exposure, and functional status are most strongly related to the risk of recurrent UTI. [5] Diabetes causes several abnormalities of the host defence system that might result in a higher risk of certain infections, including UTIs. These include immunologic impairments, such as impaired migration, intracellular killing, phagocytosis, and chemotaxis of polymorph nuclear leukocytes, and neuropathic complications and impaired bladder emptying. [6] Vitamin D deficiency has been associated with several adverse health consequences, including autoimmune diseases and infections. Vitamin D is a potent stimulator of antimicrobial peptides including cathelicidin LL-37 in innate immunity against urinary tract infections.[7] Incontinence is very common in older women. Inherited factors may also play a role in predisposing post-menopausal women to recurrent UTIs. The mechanism through which nonsecretor status predisposes to recurrent UTI is probably the presence on vaginal and uroepithelial cells of 2 unique nonsecretor-associated glycolipids that serve as binding sites for specific Escherichia coli adhesions.[8]The World Health Organization and others have high- lighted the urgent need for novel antimicrobial-sparing approaches against infectious diseases. [9] In this regard, women with recurrent cystitis are often counselled about behavioural approaches before antimicrobial prevention strategies are considered as they are creating economic burden and widespread resistance among the population. [10] Many of the risk factors associated with UTI in the population were initially identified by studying women with UTIs and rUTIs ,their symptoms past medical ,medication, surgical, family and social history, the host characteristics associated with UTI were demonstrated than in women with sporadic UTI and recurrent UTI. We thus undertook a observational study to assess factors associated with UTIs in postmenopausal women.

MATERIALS AND METHODS:

A Prospective observational study was conducted in the Urology Department at Karuna Medical College Hospital, Vilayodi, Chittur, Palakkad. The study was conducted from October 2021 to April 2022(6 months). Total 66 patient cases were taken and follow up was done.

Inclusion criteria:

- Women who have attained menopause i.e.; women who haven't had a menstrual period for at least 12 consecutive months and are diagnosed with UTI.
- Post-Menopausal women with recurrent urinary tract infections.

Exclusion criteria:

- Women who did not give consent.
- Severely ill patients admitted to ICU.
- Psychiatric patients.

Study Procedure:

Ethical Committee approval (**KMC/IHEC/05/2022**) was obtained from Karuna Medical College Hospital, Palakkad. Signed informed consent was obtained from all participants before the study. A specially designed data entry form was used to collect patient demographics. Previous medical and medication history, genetic factors, vital signs and laboratory data, ongoing treatment, use of drugs and their complications. The collected data were analyzed for identifying postmenopausal women with UTIs and associated risk factors. The patient was asked for the signs and symptoms for their admission to the hospital and noted. Their laboratory investigations, general, systemic, and other clinical manifestations were noted. The association between the risk factors and the occurrence of the disease was analyzed in the collected data. Statistical analysis was performed and documented to assess the risk factors predisposing postmenopausal women to UTIs.

RESULT AND DISCUSSION:

A total of 66 relevant case documents were obtained by the department of gynaecology and urology in Karuna Medical College hospital. Among the study population (n=66), 62.12% of patients cases from outpatient department and 37.88% of patients cases were collected from inpatient department, since many patient needs follow up there is increased number of outpatient cases**.**

In general, the natural menopause occurs between 45 and 55 years of age. In India, the range of mean age at menopause reported in different studies appears to be rather young, between 41.9 and 49.4. Menopause is the time that marks end of the menstrual cycles i.e., after 12 consecutive months without a menstrual period.

In our study population, age wise distribution of patients in the study were found to be 10 patients (15.15%) of age between 40-50years,23 patients (34.84%) between 51-60years, 22 patients (33.33%) between 61-70years, 11 patients (16.67%) above 70years and the majority of the patient population was found to be of age between 51-60 years and the mean age was 61.3 with a standard deviation of ±9.5**.**

In this analysis the older, debilitated women were found to be significantly associated with UTI in this population. The associated risk factors were history of UTI, structural and anatomical abnormalities, diabetes and deficiency of estrogen. We undertook the study to ascertain risk factors for UTIs in postmenopausal women. [11]

Our findings indicate that the most of the risk factors associated with recurrent UTI in these women

differ from those found in premenopausal women. Of the study population, 59.09% reported at least 1 previous UTI compared with 40.9% of the remaining patients, history of UTI before menopause or in childhood was more frequent in the patients which suggest a possible genetic predisposition to recurrent UTI in at least some women. Moreover, 32 patients (48.48%) reported having diabetes were more likely to report episodes of incontinence more frequent than in other patients and is strongly associated with UTI. Urinary incontinence increases the frequency with age and in the presence of other associated risk factors, including obesity, medical illness, smoking and alcohol consumption. The recurrent episodes of UTI in some women i.e., 18 patients (12.12%) had onset after urogenital surgery, most of it was hysterectomy, in addition other gynaecologic procedures that alter the normal anatomy of pelvis are likely to increase the risk of UTI. Similarly, those diagnosed with urolithiasis (7.5%), the possible underlying mechanism is the bacteria aggregating selectively to crystals, and they stimulate incorporation of proteins into stone matrix however, in our study there was insufficient number of such procedures, given our small study population.

Three urological factors- namely, incontinence (7.57%), presence of cystocele (7.57%) and post void residual urine (7.57%) were all highly associated with recurrent infection as well. Behavioural factors like holding urine (22.72%), wiping from front to back after toilet use (30.30%) is found to predispose to UTI. In women, the urethra is close to the genital and the anus. The faecal micro biota is a primary source causing UTIs via faecal-perineal-urethral route. Therefore, improving hygiene after using toilet is found to reduce the risk of contamination with E. coli.

Collected population 17 patients (25.75%) reported infection after recent admission to hospital among this13 patients (19.69%) reported catheter associated urinary tract infection, bacteria can enter the urinary tract in catheterized patients at the time of catheter insertion. This is especially common in patients who have inadequate cleansing of the perineum and distal urethra.

Among the study population, 28 patients (42.42%) diagnosed with hypertension reported UTI, high BP can constrict the Blood vessels, and in turn reduces renal perfusion and predisposing to UTI. Structural abnormalities like diverticula (1.51%)), uterine prolapse (1.51%)) and fistula (1.515%) also found to elevate the risk of UTI in the population. 2 patients (3.03%) have been reporting drug induced UTI namely cancer therapy which are chemically bladder irritant and cause vaginal dryness and predispose to UTI in post-menopausal women.

Although not directly evaluated, the reduced level of estrogen hormones after menopause appear to contribute for the occurrence of UTI, since estrogen encourages production of natural antimicrobial substances in the bladder, when estrogen level declines the uropathogens multiply and increase the risk of UTI.[12]

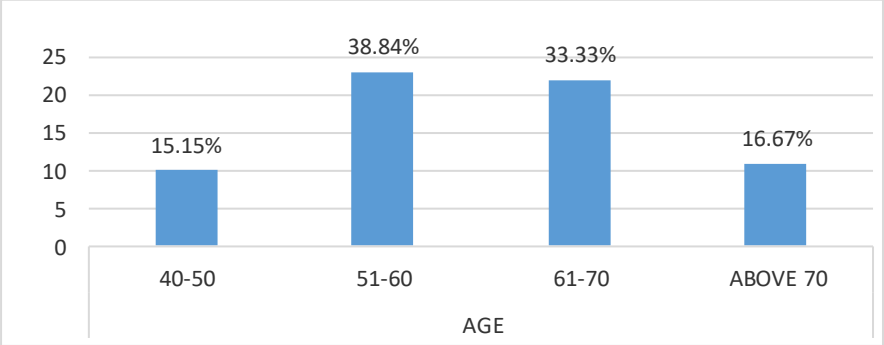
Table 1. Distribution of study population

S. no	Department	Number of patients (n=66)	Percentage (%)
1	Inpatients	25	37.88
2	Outpatients	41	62.12

Table 2. Frequency of different risk factors for recurrent UTI in postmenopausal women

S. no.	Risk factors	No. of Patients	Percentage
1	Holding Urine	15	22.72%
2	Drugs	2	3.03%
3	Wiping The Wrong Way	20	30.30%
4	Diabetes	32	48.48%
5	Decreased Water Intake	25	37.87%
6	Cystocele	5	7.57%
7	Diverticula	1	1.51%
8	Atrophic Vaginitis	5	7.57%
9	Fistula	1	1.51%
10	Indwelling Cather	17	25.75%
11	Nosocomial Infection	13	19.69%
12	Surgery	8	12.12%
13	Urinary Incontinence	12	18.18%
14	High Post Void Residual	5	7.57%
15	Urolithiasis	5	7.57%
16	History Of Premenopausal UTI	23	34.84%
17	Uterine Prolapse	1	1.51%

Fig 1. Age wise Distribution among the study population



CONCLUSION

The present study suggests that the incidence of UTIs is more common in postmenopausal women. The patient population is predominant in the age between 50-70years.by the study we can understand the risk factors predisposing postmenopausal women to UTIs includes estrogen deficiency, disease states like diabetes, administration of drugs, structural and anatomical abnormalities of urinary tract and associated regions.it was also found that certain behavioral features also predispose to the occurrence of the disease which in turn suggests certain preventive measures against the recurrence of the disease.

LIMITATION

In the study, we couldn't ascertain an accurate association of risk factors and the disease that predispose to the increased occurrence of the disease in the population due to the short duration and small sample size.

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CONFLICT OF INTEREST

No interest

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