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FREQUENCY OF URINARY TRACT INFECTION IN CATHETERISED PATIENTS ADMITTED IN TERTIARY CARE HOSPITAL

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Abstract:

Objective: *To determine the frequency of urinary tract infection in catheterised patients admitted in tertiary care hospital.*

Material and methods: *This cross sectional was conducted in Department of Urology, Sahiwal Medical College, Sahiwal from May 2018 to November 2018 over the period of 6 months. Total 200 catheterised patients (catheter in place for at least 48 hours) either male or female having age >15 years were selected. UTI was assessed in selected patients.*

Results: *Mean age of the catheterised patients was 59.33 ± 20.5 years. Out of 200 catheterised patients, UTI was developed in 62 (31%) patients. Most of the patients 86 (43%) belonged to age group years and UTI was significantly associated with age group. UTI was noted in 27 (20.77%) male patients and in 35 (50%) female patients. Association of UTI with gender was found statistically significant with p value 0.000. Diabetics were 30 (15%) and non-diabetics were 170 (85%). UTI was found in 19 (63.33%) diabetics and in 43 (25.29%) non-diabetics. Development of UTI was significantly associated with diabetes mellitus with p value 0.000.*

Conclusion: *Results of present study showed a higher number of catheterised patients with UTI. UTI was common in 3rd and 4th decade. Most of the female catheterised patients were victim of UTI as compared to Male catheterized patients. Diabetes mellitus was significantly associated with development of UTI in catheterised patients.*

Keywords: *UTI, catheter, Healthcare-associated infections*

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INTRODUCTION:

Healthcare-associated infections (HAIs) are the most frequent adverse event in the healthcare facilities and represent a significant problem for patients' safety worldwide.[1] Only in the European Union (EU), the estimated number of HAI is 4.544.100 per year, leading directly to around 37.000 deaths and 16 million extra days of hospital stay.[2] HAIs' active surveillance is an essential component of infection control program and it is a fundamental way of reducing their frequency.[3] Urinary tract infections (UTIs) are the most common type of HAIs in acute care hospital.[4] All healthcare associated UTIs are caused by devices of the urinary tract: approximately 12-16% of adult patients have a urinary catheter during their hospitalization. Patients also have a 3-7% increased risk of acquiring a catheter associated urinary tract infection (CAUTI) each day of bladder catheterization.[5]

The point prevalence studies have been recently designed as a simple and economic way to evaluate the characteristics of HAIs and the antibiotics administration. This kind of studies are a useful tool for improving qualitative care standards in hospitals. All patients with a urinary device can benefit from active surveillance programs designed to identify the main risk factors for specific patients' categories or hospital departments.[6] The guidelines for prevention of catheter-associated urinary tract infections recommend to "use standardized methodology for performing CAUTI surveillance (category IB)" in order to identify the patients groups or units on which to conduct surveillance based on frequency of catheter use and potential risk of CAUTI.[7]

The objective of this study was to determine the frequency of UTI in adult patients admitted at tertiary care hospital.

MATERIAL AND METHODS:

This cross sectional was conducted in Department of Urology, Sahiwal Medical College, Sahiwal from May 2018 to November 2018 over the period of 6 months. Total 200 catheterised patients (catheter in place for at least 48 hours) either male or female having age >15 years were selected. Pediatric patients (age <18 years old), patients with chronic urinary tract infection before the hospital admission, duration of catheterization less than 48 hours were excluded from the study.

Study is approved by ethical committee of the institution. Written informed consent was taken from every patient.

Demographic data and history of all the patients was taken. An aseptic no-touch technique had to be used to obtain a fresh urine sample. This procedure reduces the risk of cross infection thanks to the use of a sampling port on the catheter drainage bag tube.9 About 10 ml of urine sample was aspirated from the sampling port under aseptic precautions, transferred to the vacuum tube (containing boric acid 1%) and sent to the laboratory immediately.

Laboratory findings was entered in pre-designed performa in term of UTI (Yes/No).

All the collected was entered in SPSS version 18 and analyzed. Mean and SD was calculated for age. Frequencies were calculated for UTI, gender and diabetes mellitus (diabetic/non-diabetic). Stratification was done for age, gender and diabetes mellitus. Post stratification chi-square test applied to see the effect of these on outcome variable i.e. UTI. P value ≤ 0.05 was considered as statistically significant.

RESULTS:

In present study total 200 catheterised patients were selected. Mean age of the catheterised patients was 59.33 ± 20.5 years. UTI was developed in 62 (31%) patients. (Fig. 1) Selected patients were divided into 4 equal groups i.e. age group 16-30 years, age group 31-50 years, age group 51-70 years and age group >70 years. Total 86 (43%) patients belonged to age group 16-30 years followed by 77 (38.5%) patients to age group 31-50 years, 34 (17%) patients to age group 51-70 years and 3 (1.5%) patients belonged to >70 years age group. UTI was found in 16 (18.60%) patients of age group 16-30 years, in 25 (32.47%) patients of age group 31-50 years, 19 (55.88%) patients to age group 51-70 years and 2 (66.67%) patients to age group >70 years. Statistically significant association between age group and development of UTI was detected with p value 0.000. (Table 1)

Male patients were 130 (65%) and female patients were 70 (35%). UTI was noted in 27 (20.77%) male patients and in 35 (50%) female patients. Association of UTI with gender was found statistically significant with p value 0.000. (Table 2)

Diabetics were 30 (15%) and non-diabetics were 170 (85%). UTI was found in 19 (63.33%) diabetics and in 43 (25.29%) non-diabetics. Development of UTI was significantly associated with diabetes mellitus with p value 0.000. (Table 3)

Fig. 1: Frequency of UTI

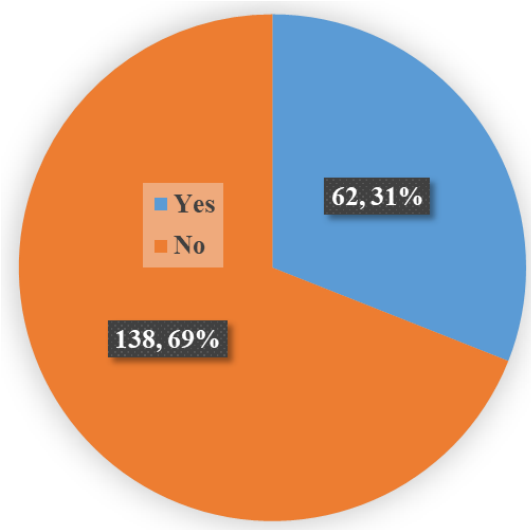

Table 1: Association of UTI with age group

Age group	UTI		Total	P value
	Yes	No		
16-30	16 (18.60%)	70 (81.40%)	86 (43%)	0.000
31-50	25 (32.47%)	52 (67.53%)	77 (38.5%)	
51-70	19 (55.88%)	15 (44.12%)	34 (17%)	
>70	2 (66.67%)	1 (33.33%)	3 (1.5%)	
Total	62 (31%)	138 (69%)	200	

Table 2: Association of UTI with gender

Gender	UTI		Total	P value
	Yes	No		
Male	27 (20.77%)	103 (79.23%)	130 (65%)	0.000
Female	35 (50%)	35 (50%)	70 (35%)	
Total	62 (31%)	138 (69%)	200	

Table 3: Association of UTI with diabetes mellitus

DM	UTI		Total	P value
	Yes	No		
Diabetic	19 (63.33%)	11 (36.66%)	30 (15%)	0.000
Non-diabetic	43 (25.29%)	127 (74.70%)	170 (85%)	
Total	62 (31%)	138 (69%)	200	

DISCUSSION:

The objective of present study was to determine the frequency of UTI in catheterized patients. UTI was present in 31% catheterized patients. Study by Lu et al UTI in 57% catheterized patients.[6] Danchaivijitr et al, found UTI in 73.3% catheterized patients.[7] Billote-Domingo K et al, reported 51.4% incidence of urinary tract infection in catheterized patients in 1998.[10] Findings of all these studies was higher than our findings.

The incidence of UTI was higher in the first week (54.83%), followed by second week (32.26%) and third week (12.91%). In first week total 06% patients developed bacteriuria within 2 days while 19.35% patients developed bacteriuria between 3-4 days and 27.42 % patients developed bacteriuria between 5-7 days.[10] Present study shows that maximum incidence (54.83%) of bacteriuria occurs during first week of catheterization. This finding is also comparable with the Study conducted by Billote-Domingo K et al, (58.20%) and

Danchaivijitr S et al (51.35%).[9-10] Out of total 62 positive samples, 27 (43.54%) were male patients and 35 (56.46%) were female. This shows higher incidence of Cauti in female patients. This indicates that females are more susceptible to Cauti than male. Higher incidence of Cauti in female patients is comparable with the Study conducted by Billote-Domingo K et al and Danchaivijitr S et al.[9-10] This increased risk in women is likely to be due to easier access of the perineal flora to the bladder along the outside of the catheter as it traverses the shorter female urethra. In addition, a woman's urethra is closer to anus. This makes it easier for bacteria to spread into her urethra and cause an infection. Rosser and colleagues retrospectively reviewed 126 trauma ICU patients with sepsis and found that increased length of stay, length of catheterization, and age (more than 60 years) were independent factors associated with the development of nosocomial UTI.[12]

Diabetics were 30 (15%) and non-diabetics were 170 (85%). UTI was found in 19 (63.33%) diabetics and in 43 (25.29%) non-diabetics. Development of UTI was significantly associated with diabetes mellitus with p value 0.000.

This indicates that diabetes is significant risk factor for catheter associated urinary tract infection. Christophe C et al also found that diabetes is a risk factor for UTI.[13] Billote-Domingo K et al, noted that out of 32 patients having diabetes mellitus 24 (75%) patient developed urinary tract infection as compared to 86 (47.25%) out of 182 non diabetes patients.[10]

In present study *E. coli* (38.71%) was found the most common isolate among all microorganisms isolated. Laupland K et al, in 2000 found *E. coli* 23%, Billote-Domingo K et al, found *E. coli* 22.30% and Danchaivijitr S et al, has found *E. coli* 15.10%.[14, 9-10]

Isolation rate of *Enterococcus*, 3.26% of present study is comparable with study of Billote-Domingo K et al, and Danchaivijitr S et al, showing isolation rate of 7.40% and 12.60% respectively.[9-10] Uropathogens isolated from UTI are more resistant to antimicrobials compared with community acquired ones.[15-16] Eradication of these micro-organisms in the presence of urethral catheter is difficult and is often impossible due to antimicrobial resistance and the presence of biofilm on the inner surface of the catheter.[16] Resistance to antimicrobial agents has been noted since the first use of these agents and is an increasing world-wide problem.[17]

CONCLUSION:

Results of present study showed a higher number of catheterised patients with UTI. UTI was common in 3rd and 4th decade. Most of the female catheterised patients were victim of UTI as compared to Male catheterized patients. Diabetes mellitus was significantly associated with development of UTI in catheterised patients.

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