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Chronic indwelling foley catheter, a risk factor for catheter associated urinary tract infection.

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ABSTRACT… Objectives: This study was intended to investigate the frequency of urinary tract infection caused by chronic indwelling urethral catheters. **Study Design:** Cross Sectional study. **Setting:** Department of Urology & Renal Transplantation, Allied Hospital, Faisalabad. **Period:** 6 months between 01-12-2015 to 31-05-2016. **Material & Methods:** Informed consent was taken from all the 100 patients which were selected for the research purpose. Under aseptic conditions, indwelling urethral catheter was replaced. The Foley catheter tip which we had taken out was cut and separated. It was delivered to the pathologist for culture and sensitivity in a secured axenic container. Diabetes was ruled out using blood sugar fasting levels. Data was recorded using a proforma. **Results:** In our study, out of 100 cases with chronic supra-pubic or urethral Foley catheter, 53% cases (n=53) were aged below 50 years while 47% (n=47) were aged above 50 years. Furthermore, 95% patients (n=95) were men and only 5% (n=5) were women. 18% participants of our study were recorded to have urinary infection associated with chronic catheterization. **Conclusion:** We found that urinary infection affects the patients having chronic indwelling urethral catheters significantly. Therefore, it is justified to assess every patient having urethral catheter for possible urinary infection.

Key words: Chronic Indwelling Catheter, Long Standing Urethral Catheter, Urinary Infection.

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INTRODUCTION

Catheter associated infection is one of commonest infection which affects hospital admitted patients.[1] Urinary catheter is the most commonly used indwelling device. Indwelling catheter is responsible for approximately 70–80% of urinary infections.[2] Indwelling urethral catheters which are kept in place for 30 days or less are called short term. Whereas, when catheter placement exceeds 30 days, it is known as chronic or long term. Catheter associated urinary tract infection (CAUTI) is assigned to catheterized individuals having symptoms like fever and suprapubic pain. 50% of bacteremia episodes are preceded by CAUTI in long-term healthcare facilities.[3] 60% of CAUTI episodes can be prevented using evidence based prevention practices.[4] Patients having urethral catheter in situ harbour 3-36 times more risk of bacteremia than the individuals without an indwelling catheter.[5] Apart from CAUTI urethral catheters lead to many other infectious and non-infectious complications. Purulent urethritis, abscess formation and prostatitis are the infectious complications.[5] Catheter blockage, bladder stones, urethral strictures, impaired mobility and mechanical trauma due to catheter contribute to non-infectious complications.[6]

Patients who are unable to void by themselves due to either bladder outlet obstruction or under-activity of detrusor muscle require chronic or long term catheterization. Individuals having severe incontinence, neuropathic bladder dysfunction due to spinal cord injury or paralyzed bed ridden patients may also require chronic catheterization in order to improve the quality of life.[7] And this long term catheterization is an independent risk factor for CAUTI development.[8] The incidence of UTIs among hospitalized patients with indwelling catheters is approximately 15% hospitalized

patients develop urinary infection due to an indwelling urethral device.[9]

Culture of midstream specimen of urine remains the gold standard choice to diagnose a case of UTI.[10] CAUTI is diagnosed using positive culture of urine with atleast $\geq 10^5$ CFU/ml or urine culture yielding 10^3 to 10^5 CFU/ml with positive urinalysis. Presence of microorganisms on gram stain or pyuria on urinalysis is labeled as positive urinalysis.[1]

By conducting this study, we can find out the magnitude of the commonest acquired infection amongst hospitalized individuals in the region i.e., CAUTI. In this way we can turn our attention towards changing the indwelling Foley catheters regularly and the use of external catheters in patients who don't have bladder outlet obstruction. Alternatively clean intermittent catheterization is another safe option for individuals having bladder outlet obstruction.

MATERIAL & METHODS

This was a cross-sectional study conducted at department of Urology & Renal transplantation of Allied Hospital, Faisalabad for a period 6 months between 01-12-2015 and 31-05-2016. Patients aged 15 - 70 years of either gender having a supra-pubic or urethral Foley catheter in situ for > 30 days were enrolled for the study purpose. However, diabetic, immuno-compromised or patients who have taken antibiotics within the last 2 weeks were ruled out of the study.

After taking approval from the ethical review committee, total 100 patients were selected for the study and consent was obtained on a proforma for the investigations and use of data for research purpose. Under aseptic conditions, indwelling urethral catheter was replaced. The Foley catheter tip which we had taken out was cut and separated. It was delivered to the pathologist for culture and sensitivity in a secured axenic container. Diabetes was ruled out using blood sugar fasting levels. Data was recorded using a proforma.

Data analysis was done using SPSS v-17. Mean along with standard deviation was determined for all quantitative variables like age. Percentages and frequencies were determined for all qualitative variables like UTI and gender. Stratification was used to control effect modifiers like age and gender. Post-stratification chi-square test was applied. P-value < 0.05 was taken as significant.

RESULTS

Out of 100 patients enrolled in the study, 53% (n=53) were aged below 50 years whereas 47% (n=47) were aged above 50 years. Mean age was 46.45+12.39 years. Majority 95% (n=95) of patients were male and only 5% (n=5) were females.

18% cases (n=18) having chronic indwelling urethral catheter were having UTI. However, 82% cases (n=82) had no urinary tract infection. (Figure-1).

Patients having CAUTI were stratified in terms of age and gender. Table-I & II show the distribution of patients according to age and gender respectively.

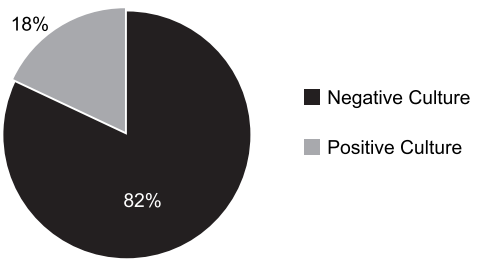

Figure-1. Distribution of patients according to culture.

Age (in years)	CAUTI	
	Yes	No
Below 50	11	42
Above 50	7	40

Table-I.

Gender	CAUTI	
	Yes	No
Male	17	78
Female	1	4

Table-II.

DISCUSSION

CAUTI is a big matter of debate especially in developing countries. It is responsible for significant economic burden and utilizes valuable health resources. In our study, 18% patients having chronic urethral catheter were recorded to have UTI. Lee JH et al recorded the 15% prevalence of UTIs among individuals harboring Foley catheters.[9] Whereas, Letica-Kriegel AS et al found that duration of indwelling urethral catheter is a risk factor for 16.5% episodes of CAUTI. Out of these 12% of patients develop CAUTI.[11] These findings are in agreement with our study.

CAUTI rates increased in United States by 6% over 4 years between 2009 and 2013.[11] CAUTI in intensive care units of NHSN hospitals has decreased by 18.5%-67% during 1990–2007.[12] Venhems P reported a 66% reduction in CAUTI over 10 years in France.[13] This decline is partially due to intense efforts taken for prevention, but most of it is a result of exclusion of asymptomatic bacteriuria from the definition of CAUTI. With every passing catheter day, risk of developing CAUTI increases by 5%.[4]

3–10% of residents in United States are being managed using long term Foley catheters.[14] Surveillance reports of European advocate presence of Foley catheters in 12% residents of Dutch nursing homes[15], 12.3% in Italian nursing homes[16] and 10.1% German nursing homes.[17] In Swedish homes, prevalence of Foley catheters was 7%. Among these 16% are men and only 3% are women.[18] Patients with chronic Foley catheters have increased risk for developing symptomatic UTI. According to Stevenson KB et al, CAUTI rates 3.2/1,000 catheter days were seen in health care facilities of Idaho.[19] Letica-Kriegel AS et al identified a rate of CAUTI as 1.64 per 1000 catheter-days.[11] Incidence of febrile illness from a likely urinary device is 7–11/1000 catheter days, which is approximately three times more than the incidence in patients without a Foley catheter.[20]

Tambyah PA et al studied that 3% of patients having catheter associated asymptomatic bacteriuria progress to bacteremia with the urinary pathogen.[21] However, CAUTI is the most common etiological factor which lead to bloodstream infection in health care facilities. In Quebec study, 21% of hospital acquired hematological infections were attributable to a urinary source. Mortality in individuals diagnosed with CAUTI and subsequent development of bacteremia was 15%.[22]

In summary, the CAUTI rates which were determined by our study have comparable results with other international studies. However, more studies with bigger sample size are required for further establishment of facts.

CONCLUSION

It is concluded that urinary infection rate is definitely higher among patients with chronic Foley catheters in our population possible due to poor hygiene and improper catheter care. It is therefore required that every patient having indwelling catheter should be evaluated for possible urinary tract infection.

RECOMMENDATIONS

1. We recommend frequent and timely changing the indwelling Foley catheters or clean intermittent catheterization in patients with bladder outlet obstruction.
2. Bed ridden or unconscious patients who don't have any bladder outlet obstruction should be managed with external catheters instead of indwelling catheters.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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3	Hanan Noor	Literature review and Data analysis.	
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