



ISSN : 2350-0743

www.ijramr.com



International Journal of Recent Advances in Multidisciplinary Research

Vol. 06, Issue 10, pp. 5244-5247, October, 2019

RESEARCH ARTICLE

A STUDY TO ASSESS THE EFFECTIVENESS OF URINARY CATHETERIZATION CHECK LIST IN PREVENTION OF CATHETER ASSOCIATED URINARY TRACT INFECTION

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ARTICLE INFO

Article History:

Received 09th July, 2019

Received in revised form

16th August, 2019

Accepted 14th September, 2019

Published online 18th October, 2019

Keywords:

Catheter associated urinary tract infection (CAUTI), Prevention

ABSTRACT

Objectives:-To identify the prevalence of catheter associated urinary tract infection in critical care unit. To formulate structured urinary catheterization checklist and implement in the hospital. To evaluate the effectiveness of urinary catheterization checklist to reduce catheter associated urinary tract infection. **Methods:** - An experimental research was conducted on 300 samples in Dr. L H Hiranandani hospital. Non probability purposive sampling technique was used for the study. Urinary catheterization checklist implemented. Checklist was used to collect the data. **Result:** - 80% of all intensive care unit patients are treated with urinary catheter. Catheter associated urinary tract infection caused by improper handling of catheter, not using aseptic techniques while insertion and collection of urine. In this study a urinary catheter checklist is implemented to check the insertion technique, to maintain the catheter properly and to reduce the incidence of CAUTI. Rate of catheter associated urinary tract infection before implementation of urinary catheterization checklist was higher that is 5.33 % and it is decreased to 1.33% after implementation of checklist. **Conclusion:** - Urinary tract infection is a major lead to hospital associated morbidity and mortality. 32%of hospital associated infections and 13% of death due to catheter associated infections are noted. There are many risk factors which is causing urinary tract infection. But the major contributor for infection is presence of urinary catheter. CAUTI is mainly occurred when the patient care is compromised. Reduction of incidence rate should focus on identifying the high risk patients. Urinary catheterization checklist focused on identification of high risk patients and therefore reduction in the CAUTI incidence.

INTRODUCTION

Infection occurs during the hospital stay is known as nosocomial infections. This is specifically significant in chronic illness patients [Alberto F Monegro, 2018]. Catheterization is the common procedure frequently required in hospitalized patients. Catheter associated infection is a major as well as potentially life threatening. An estimate of 7-10% of all chronic ill patients have catheter. Approximately 96million urethral catheters are sold each year worldwide [AHRQ safety program for long term care, 2017]. The most common type of health care associated infection is catheter associated infection, which is accounting for more than 30% of infections [Lindsay, 2014]. Nearly all hospital acquired urinary tract infections are caused by urinary catheterization. CAUTI increases morbidity, mortality, length of hospital stay and the hospital cost. Mortality rate of CAUTI is less than 5%. CAUTI incidence rate is 6 times higher than the number of central venal catheter. CAUTI is the second most common cause of nosocomial infections [Allison S Letica-Kriegel, 2019]. Catheter insertion may push the organism into the uninfected bladder. Extra luminal colonization of the catheter with organism into the urinary tract.

Entry of infection via lymphatic or haematogenous route is proven through minor portal of entry. Hospital stay will be extended by approximately 3 days for the patient who developed catheter associated urinary tract infection [Sangamithra, 2017]. Common complications of CAUTI are cystitis, pyelonephritis, gram negative bacteremia, prostatitis, septic arthritis and meningitis. Complications causes discomfort to patient, extends the hospital stay and mortality rate. The most frequent organism found with CAUTI were E.Coli (26.8%), pseudomonas aeruginosa (11.3%), klebsiella (11.2%), candida albicans (8.9%), enterococcus (4.8%), smaller proportion was caused by staphylococcus aureus (2.1%), and acinobactor baumannii (0.9%) [Indramil Bagchi et al., 2015]. Prevention of CAUTI and its complications can reduce the rate of morbidity and mortality. Avoiding inappropriate decision for catheterization will reduce most of the catheter associated urinary tract infection. Use of aseptic techniques while insertion decreases the introduction of outside organism in to the uninfected bladder [Farahnak Assadi, 2018]. Reducing bacterial colonization around the meatal or urethral area has the potential to reduce CAUTI risk. However, evidence about the best antiseptic solutions for meatal cleaning is mixed, resulting in conflicting recommendations in guidelines internationally [Brett G Mitchell, 2017].

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MATERIALS AND METHODS

Participants: A total of 300 participants were selected by non probability purposive sampling technique. Participants are selected from intensive care units of Dr. L H Hiranandani Hospital. Patients with urinary catheter are included in the study.

Tool: Urinary Catheterization Checklist was used to collect the data regarding the catheter associated urinary tract infection. Socio-demographic data included the following age, sex co-morbidities, diagnosis and date of admission.

Data collection: Researcher informed the participant about the objectives of the study at the beginning and guaranteed that the research was anonymous. Informed consent was obtained from the participants. Urinary catheterization checklist is used to collect the data.

Data Analysis

Data collected from 300 samples were analyzed by using descriptive statistics.

RESULTS

Table no.1 describes the frequency and percentage distribution of demographic variables. Total samples were 300 from that maximum were between 50 to70 age group that is 39.33% and 31% were between the age group of 70 to 90. 23.01% was between 30 to 50 and 10 to 30 were 5%.

Table 1. Frequency and percentage distribution of demographic variables

N=300		
Demographic variables	Frequency	Percentage
Age		
10-30	15	5%
30-50	69	23.01%
50-70	118	39.33%
70-90	93	31%
>90	5	1.66%
Gender		
Male	153	51%
female	147	49%
Co-Morbidities		
Diabetes	82	27.4%
Hypertension	119	39.6%
Renal	42	14%
Cardiac	57	19%
Number Of Catheter Days		
1-5	204	68%
5-10	65	21.68%
10-15	16	5.33%
15-20	7	2.33%
>20	8	2.66%

Table no.2 Relationship between cauti and age

N=300			
Demographic variables	Frequency	Frequency of CAUTI patients	Percentage
AGE			
10-30	15	1	6.66%
30-50	69	0	0
50-70	118	4	3.38%
70-90	93	5	5.37%
>90	5	0	0

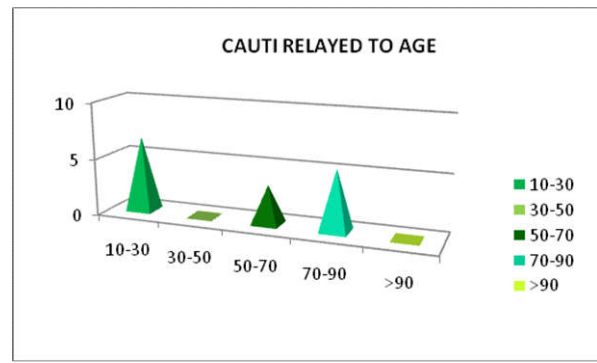


Figure 1. Percentage of CAUTI related to age

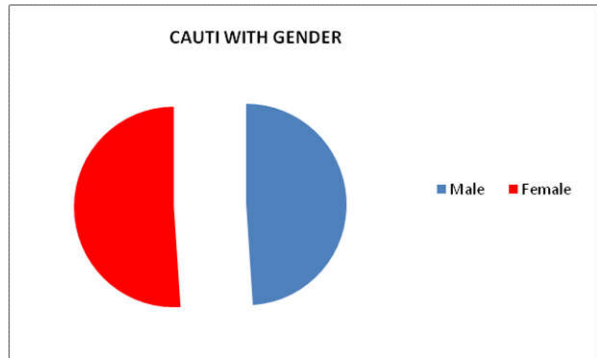


Figure 2. Percentage of CAUTI related to gender

Table 4. Relationship between cauti and number of catheterized days

N=300			
Demographic variables	Number of catheterized days	Frequency of CAUTI patients	Percentage
1-5	204	2	0.98%
5-10	65	1	1.53%
10-15	16	2	12.5%
15-20	7	1	14.28%
>20	8	4	50%

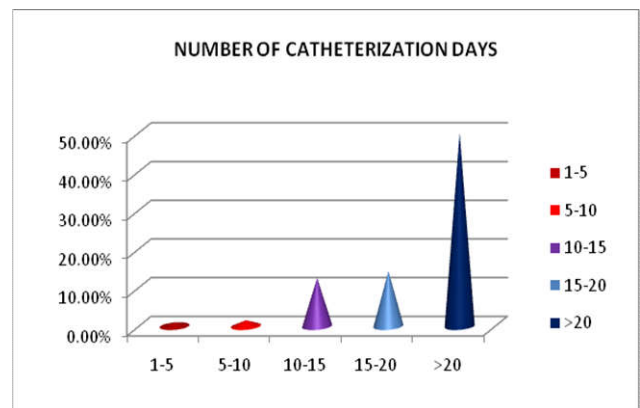


Figure 3. Percentage of catheterization days

Table 5. Cauti related to co-morbidities

N=300			
Demographic variables	Frequency	Frequency of CAUTI patients	percentage
Diabetes	121	6	4.9%
Hypertension	171	7	4.09%
Renal	50	4	8%
Cardiac	57	2	3.50%
None	96	1	1.04%

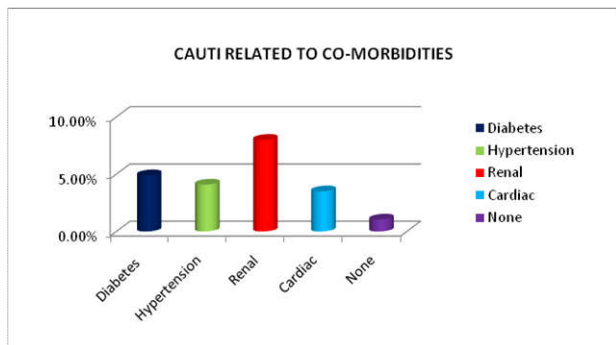


Figure 4. Percentage of co-morbidities

Table 6. Effectiveness of urinary catheterization checklist in rate catheter associated urinary tract infection

N=300		
TEST	FREQUENCY CAUTI	PERCENTAGE
PRE-TEST	8	5.33%
POST-TEST	2	1.33%

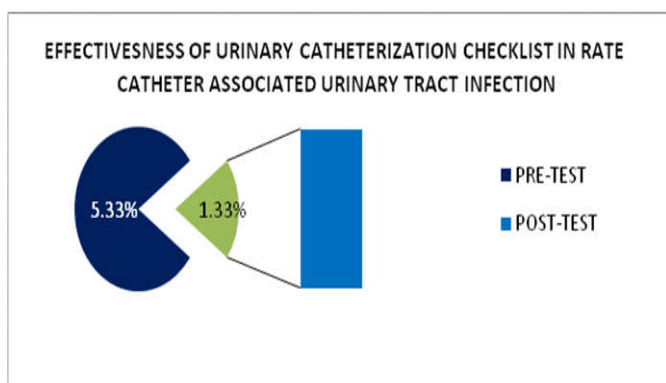


Figure 5. Percentage of CAUTI

Least samples that are 1.66% were more than 90 age group. Maximum were male participants 51% and 49% of female participants. Participants were present with different co – morbidities. 27.4% with diabetes, 39.6% with hypertension, 14% with renal issues and 19% with cardiac problems. Maximum catheterization days was between 1 to 5 days, 21.68% was between 10 to 15 days and few were catheterized for more days that is 5.33% were between 10 to 15 days, 2.33% between 15 to 20 days and 2.66% for than 20 days. Table no.2 shows the relationship between CAUTI and age. 6.66% with catheter associated urinary tract infection patients were between the age group of 10-30, 3.38% were 50-70 and 5.37% were 70-90. This table reveals that CAUTI is more affected to the age group 10 to 30, 50-70 and 70-90. From this also 10-30 age group had more infection rate. Table no 3 indicates the relationship between CAUTI and gender. In view of this values there is no much difference between gender. Both gender affected with CAUTI. This shows that gender is not a risk factor for CAUTI. Table no.4 shows the relationship between CAUTI and number of catheterization days. This numbers proves that the increase in catheterization days makes more prone for infection. 50% of participants affected with CAUTI were on catheter for more than 20 days, 14% for more than 15-20 days, and 12.5% were 10-15 days. Minority of infected patients was on catheter for less than 10 days that are 1.53% for 5-10 days and 0.98% for 1-5 days. Catheterization days are related to catheter associated urinary tract infection.

Table no.5 shows the relation of CAUTI with co-morbidities. This figures shows that patients with renal issues are affected more with CAUTI (8%), followed by diabetes and hypertension 4.9% and 4.09%. cardiac conditions also shows effect on CAUTI 3.50%. at the same time patients with no co-morbidities also affected with CAUTI 1.04%. As per the figures presence of co-morbidities increased the risk of catheter associated urinary tract infection. Table no 6 shows the effectiveness of urinary catheterization checklist. During pretest 5.33% of participants were affected with catheter associated urinary tract infection but post test shows only 1.33% of catheter associated urinary tract infection. Hence, proved that the urinary catheterization checklist is effective in preventing catheter associated urinary tract in infection.

DISCUSSION

In this research we primarily focused to evaluate the prevalence of CAUTI in ICU before introducing the urinary catheterization checklist. 5.33% of samples presented with catheter associated urinary tract infection. Pretest was done in 150 samples. After introduction of checklist we rechecked the prevalence of catheter associated urinary tract infection in ICU with 150 samples. 1.33% of samples were affected with CAUTI. There is reduction of CAUTI by 4%. hence proved that urinary catheterization checklist is effective in prevention of CAUTI. We also analyzed the relation of CAUTI with age, gender, co-morbidities, and number of catheterized days. The age groups including 10-30, 50-70, and 70-90 were more affected. 10-30 age group shown high prevalence than other age groups.

As per the research there is no much relation between gender and catheter associated urinary tract infection. co-morbidities also shows effect on CAUTI specifically renal issues. Also diabetes and hypertension shows some effect. Increases in number of catheterized day’s results in infection. 50% of samples were affected when the catheter was inside for more than 20 days. Maximum of the affected samples were having catheter for more than 10 days. Hence, there is a relation between number of catheterization days and CAUTI. This study is supported with a similar study done by Benjamin I .Siegal and etall on impact of daily PICU rounding checklist on urinary catheter utilization and infection. The result of the study suggests that checklist reduced the urinary catheter utilization by 40% [Benjamin I Siegal, 2018].

Conclusion

This study mainly focused on the prevalence of catheter associated urinary tract infection and the prevention methods. Also discussed about the relation of CAUTI with age, gender, co-morbidities and number of catheterized days. It provides the evidence of effectiveness of urinary catheterization checklist.

Acknowledgement

We express our gratitude to the Management of Dr L H Hiranandani Hospital Powai, Mumbai for the full support and encouragement for executing this research. Our special thanks to our CEO Dr. Sujit Chatterjee for his constant inspiration. We take this opportunity to express our sincere gratitude to our entire nursing team.

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