IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 22, Issue 3 Ser.2 (March. 2023), PP 51-55
www.iosrjournals.org

Awareness amongst doctors and nurses of a rural tertiary medical college regarding safe urinary catheterization practices - A survey

Naman Hurria[1], Manjit Tanwar[2], Sandhya Gupta[2], Abhishek Dagar[1*], Aayushi[3], Udeesha Singh[3], Pawan Tiwari[4]

1.Post graduate resident, Department of General Surgery, Faculty of Medicine and Health Sciences, SGT University, Gurugram, India
2. Assistant Professor, Department of General Surgery, Faculty of Medicine and Health Sciences, SGT University, Gurugram, India
3. MBBS student, Faculty of Medicine and Health Sciences, SGT University, Gurugram, India
4. Professor, Department of General Surgery, Faculty of Medicine and Health Sciences, SGT University, Gurugram, India
**Corresponding author*

Abstract
Introduction –
Catheter associated urinary tract infection (CAUTI) is an unacceptable consequence of fallacious urinary catheter insertion and maintenance technique. Its incidence can be easily brought down by following CAUTI prevention guidelines. Our study aims to evaluate knowledge, attitude and practices of health care workers (HCWs) at SGT hospital, Gurugram.
Methodology –
A questionnaire assessing knowledge, attitude, and practices towards CAUTI was developed indigenously based on CDC guidelines. This was shared with 189 HCWs (Doctors – 141 and Nurses- 48). Their responses were analyzed statistically to comprehend variance in knowledge, attitude, and practices of doctors versus nurses. Divergence in knowledge, attitude and practices of HCWs based on their range of professional experience was assessed too.
Results-
Results were indicative of the fact that our HCWs were not upbreast with latest CAUTI prevention guidelines. Doctors were found to have significantly better knowledge, attitude, and practices towards CAUTI prevention as compared to nurses.
Conclusion-
Educating and training hcws on CAUTI prevention guidelines, regular CAUTI specific audits & usage of CAUTI prevention safety checklists are some of the efforts that may be carried out to prevent CAUTI and its burden on health care.
Keywords*- Catheter associated urinary tract infection (CAUTI), Health care workers (HCW)*

Date of Submission: 24-02-2023 Date of Acceptance: 05-03-2023

I. Introduction

Urinary tract infection (UTI) is one of the commonest nosocomial infections; 70% to 80% of these infections are due to urethral catheterization.[1,2] Catheter associated urinary tract infections (CAUTI) account for increased morbidity and medical expenses[3,4]. As the catheterization time increases, the risk of infection increases as well.[3]. Moreover, approximately 1.7% to 3.6% of patients with CAUTI can develop bacteremia.[5]
Among the hospital acquired infections, CAUTI isone of the most preventable infections if recommended infection control measures are undertaken.[6]In 2009, Centers for Disease Control and Prevention (CDC) updated and expanded original guidelines for prevention of Catheter-associated Urinary Tract Infections (CAUTI) published originally in 1981. [7,8]

In India, studies assessing the knowledge of healthcare professionals about the indications for catheter insertion and prevention of CAUTI are limited. This study is intended to assess this knowledge along with the attitude of healthcare professionals towards CAUTI.

II. Methodology

A structured questionnaire comprising of 20 questions was developed based onCDC guidelines.[7] The contents of the questionnaire were assessed independently by all the authors for simplicity of questions, accuracy, clarity of language and adequacy of questions for the purpose of this study.The survey covereddemographic details of the doctors and nurses of our institute along with their qualification, designation, years of experience in healthcare setup after obtaining graduation.

The questionnaire wasdesigned to test the knowledge of nurses and doctors regarding indications of catherization, technique of catheterization, catheter maintenance and CAUTI. It also assessed attitude of nurses and doctors towards CAUTI.

The questionnaire was filled out by 148 doctors and 41 nurses working in various departments involved with routine catheterization practices at our institute.

Their answers were compared with the CDC guidelines and results were analysed.

Statistical Analysis-

The presentation of the categorical variables was done in the form of number and percentage (%). On the other hand,the quantitative data were presented as the means ± SD and as median with 25th and 75th percentiles (interquartile range). The data normality was checked by using Kolmogorov-Smirnov test. The cases in which the data was not normal, we used non parametric tests. The following statistical tests were applied for the results:

1. The comparison of the variables which were quantitative and not normally distributed in nature were analyzed using Mann-Whitney Test (for two groups) and Kruskal Wallis test (for more than two groups).
2. The comparison of the variables which were qualitative in nature were analysed using Chi-Square test. If any cell had an expected value of less than 5 then Fisher's exact test was used.

The data entry was done in the Microsoft EXCEL spreadsheet and the final analysis was done with the use of Statistical Package for Social Sciences (SPSS) software, IBM manufacturer, Chicago, USA, ver 21.0.

For statistical significance, p value of less than 0.05 was considered statistically significant.

III. Results

The study results have been tabulated in tables given below. While analyzing the results of this study, some statistically significant gaps were found in knowledge of doctors vs nurses (table1).

Doctors had significantly better knowledge on indications of catheter use in incontinent patients(p-0.002), use of prophylactic antibiotics in catheterized patients (p-0.005), periurethral care guidelines (p-0.004), and on usage of antimicrobials for bladder irrigation (p-0.004).

A statistically significant difference was observed in attitude of doctors vs nurses (Table 2) on acceptance of using a CAUTI prevention safety checklist with doctors showing better attitude towards its use(p-0.006).

When comparison was made between knowledge of HCWwith difference in experience after graduation, it was found HCW with <1year of experience had significantly poor knowledge regarding CAUTI prevention guidelines. (Table 3)

Table 1:-Comparison of domain 1(knowledge) between doctors and nurse.

Domain1(knowledge)	Doctor(n=148)	Nurse(n=41)	Total	P value
Acute retention of urine is an indication for indwelling urethral catheter use	121 (83.45%)	32 (96.97%)	153 (85.96%)	0.051†
Critically ill patients should be catheterized for accurate measurement of urinary output	146 (94.19%)	39 (95.12%)	185 (94.39%)	1†
Indwelling urethral catheter should be used as a substitute for nursing care of patient with incontinence	58 (43.94%)	6 (15.79%)	64 (37.65%)	**0.002**‡
Indwelling urethral catheter should be used for management of open sacral or perineal wounds in patients with urinary incontinence	95 (74.80%)	28 (75.68%)	123 (75%)	0.914‡
Indwelling urethral catheter should be used when prolonged effect of epidural anaesthesia	111 (86.72%)	31 (79.49%)	142 (85.03%)	0.268‡

is anticipated				
Urinary catheterisation should be performed using aseptic technique and sterile equipment in a hospital setting	150 (97.40%)	42 (100%)	192 (97.96%)	0.58†
Patients requiring chronic intermittent catheterisation in the domiciliary care setting, a clean technique is acceptable	120 (84.51%)	30 (73.17%)	150 (81.97%)	0.096‡
Use of systemic antimicrobials is routinely recommended to prevent CAUTI in patients requiring catheterisation	57 (40.14%)	5 (14.71%)	62 (35.23%)	**0.005**‡
Instead of routine hygiene, antiseptics should be used for cleaning peri-urethral area to prevent CAUTI while the catheter is in place	34 (24.64%)	2 (4.88%)	36 (20.11%)	**0.004**†
Advisable to irrigate bladder routinely with antimicrobials to prevent CAUTI while the catheter is in place	62 (49.60%)	5 (12.82%)	67 (40.85%)	**<.0001**‡
Before the removal of indwelling catheter, catheter clamping is advised	29 (22.14%)	12 (29.27%)	41 (23.84%)	0.35‡
Routinely changing indwelling catheters or drainage bags at fixed intervals is recommended	11 (7.43%)	3 (7.32%)	14 (7.41%)	1†

† Fisher's exact test, ‡ Chi square test

Table 2:-Comparison of domain 2(attitude) between doctors and nurse.

Domain 2(attitude)	Doctor (n=153)	Nurse (n=42)	Total	P value
Periodic in-service training regarding insertion, maintenance, and removal of urinary catheter reduces risk of CAUTI	149 (98.68%)	37 (94.87%)	186 (97.89%)	0.187†
CAUTI is a serious problem	143 (96.62%)	38 (90.48%)	181 (95.26%)	0.111†
CAUTI is not preventable	127 (85.23%)	31 (79.49%)	158 (84.04%)	0.383‡
A safety checklist for indwelling urinary catheter insertion should be used routinely	151 (98.69%)	37 (88.10%)	188 (96.41%)	**0.006**†

† Fisher's exact test, ‡ Chi square test

Table 3:-Comparison of domain 1(knowledge) between <1, 1-5 and >5 years experience after graduating.

Domain 1(knowledge)	<1(n=74)	1-5(n=86)	>5 (n=29)	Total	P value
Acute retention of urine is an indication for indwelling urethral catheter use	60 (83.33%)	65 (84.42%)	28 (96.55)	153 (85.96)	0.184†
Critically ill patients should be catheterized for accurate measurement of urinary output	77 (97.47%)	78 (90.70%)	30 (96.77)	185 (94.39)	0.174†
Indwelling urethral catheter should be used as a substitute for nursing care of patient with incontinence	23 (34.33%)	31 (41.33%)	10 (35.71)	64 (37.65)	0.673‡
Indwelling urethral catheter should be used for management of open sacral or perineal wounds in patients with urinary incontinence	44 (67.69%)	58 (80.56%)	21 (77.78)	123 (75%)	0.207‡
Indwelling urethral catheter should be used when prolonged effect of epidural anaesthesia is anticipated	55 (85.94%)	65 (85.53%)	22 (81.48)	142 (85.03)	0.878†
Urinary catheterisation should be performed using aseptic technique and sterile equipment in a hospital setting	74 (96.10%)	87 (98.86%)	31 (100%)	192 (97.96)	0.383†
Patients requiring chronic intermittent catheterisation in the domiciliary care setting, a clean technique is acceptable	63 (90%)	65 (78.31%)	22 (73.33)	150 (81.97)	0.07‡
Use of systemic antimicrobials is	13	38	11	62	**0.0009**‡

routinely recommended to prevent CAUTI in patients requiring catheterisation	(18.84%)	(48.10%)	(39.29)	(35.23)	
Instead of routine hygiene, antiseptics should be used for cleaning peri-urethral area to prevent CAUTI while the catheter is in place	10 (14.93%)	18 (21.69%)	8 (27.59)	36 (20.11)	0.323‡
Advisable to irrigate bladder routinely with antimicrobials to prevent CAUTI while the catheter is in place	19 (29.69%)	32 (43.84%)	16 (59.26)	67 (40.85)	**0.025**‡
Before the removal of indwelling catheter, catheter clamping is advised	16 (23.53%)	21 (27.63%)	4 (14.29)	41 (23.84)	0.365‡
Routinely changing indwelling catheters or drainage bags at fixed intervals is recommended	4 (5.41%)	9 (10.47%)	1 (3.45%)	14 (7.41%)	0.475†

† Fisher's exact test, ‡ Chi square test

IV. Discussion

Though indwelling urinary catheters are commonly used in acute care hospital settings, an appropriate medical indication is often missing. Excessive catheterization without proper indications leads to higher chances of CAUTI. This incidence of CAUTI in turn increases the hospital stay of the patient, the cost of stay and also is associated with higher morbidity.[9]

The lack of knowledge regarding appropriate use increases it's unindicated usage of urinary catheter and subsequently the risks of CAUTI.In our study we found that 84.21% nurses and 56% doctors thought that an indwelling urinary catheter should be used as a substitute for nursing care in patients with incontinence . This clearly shows, that even though the doctors had better knowledge than nurses overall yet more than half them were unaware of the correct indications of urinary catheterization . In a similar study conducted at tertiary care hospital in Delhi,[9] it was found that a similar79 percent of nurses but far fewer percent (12 %) of doctors agreed with the above statement.

The use of systemic antimicrobials prophylactically is an outdated concept and should no longer be practiced.[7,8]Systemic antimicrobials increases health care costs, predisposes patients to side effects of unnecessary antibiotics, and increase chances of acquiring resistance to the particular antimicrobial.[10]In our study, almost 60 percent of doctors and 85% of nurses believed prophylactic antibiotics should be administered. The more disturbing fact was that HCWs(Health care worker) with >5 year experience were more likely to use systemic antibiotics as compared to those having 1-5 yrs of experience (61% vs 52%). This clearly indicates older HCW are rigid in their practice an are unwilling to embrace newer practices.

The use of antiseptics for cleaning peri-urethral area instead of routine hygiene with soap and water was also preferred by >95% of the nurses and >75% of the doctors. Multiple studies indicate that the practice of periurethral cleaning with an antiseptic did not decrease the rates of bacteriuria and is not useful.[11,12]

Bladder irrigation using antimicrobials provides no additional benefit than daily bladder irrigation with normal saline, hence it is recommended to use normal saline instead of antimicrobials. In our study we found, a total of 40.85% HCW perceive, that irrigation should be done using antimicrobials. A clear corelation of knowledge with the experience can be made out with only 30% of < 1 year experience HCW find bladder irrigation by antimicrobials to be incorrect. An increase in experience, i.e. 1-5 years(43.84%), more than 5 years(59.26%), shows theunderstanding and knowledge on this subject increased. Furthermore, on doing a subset analysis approximately 38% of our doctors and 79% nurses were in favour of the wrong practice of using antimicrobials for bladder irrigation.

This study has shown us big gaping holes in our CAUTI prevention efforts and we need to actively work in this area to improve patient care.A gross deficiency was found in the knowledge of HCWs with <1 year of experience regarding CAUTI prevention (Table 3) .Organising training sessions for both doctors and nurses as well as constituting a monitoring team to see the progress of the training in terms of outcomes in real time, area few steps which can be taken to address this issue.

V. Conclusion

For reducing the risk of CAUTI a combined action and effort from both doctors and nurses is required. The health care workers should be educated and engaged at the institutional level to reduce the risk of CAUTI.

References

[1]. Saint S, Chenoweth CE. Biofilms and catheter-associated urinary tract infections. Infect Dis Clin North Am 2003; 17:411–432.
[2]. Weber DJ, Sickbert-Bennett EE, Gould CV, Brown VM, Huslage K, Rutala WA. Incidence of catheter-associated and non-catheter-associated urinary tract infections in a healthcare system. Infect Control Hosp Epidemiol 2011; 32:822–823.
[3]. Saint S. Clinical and economic consequences of nosocomial catheter-related bacteriuria. Am J Infect Control 2000; 28:68–75.
[4]. Tambyah PA, Knazinski V, Maki DG. The direct costs of nosocomial catheter-associated urinary tract infection in the era of managed care. Infect Control Hosp Epidemiol 2002; 23:27–31.
[5]. Tambyah PA, Maki DG. Catheter-associated urinary tract infection is rarely symptomatic. Arch Intern Med. 2000; 160:678- 682.
[6]. Umscheid C, Mitchell M, Agarwal R, Williams K, Brennan P. Mortality from reasonably preventable hospital acquired infections. included in written testimony by the society of healthcare epidemiology of america for the committee on oversight and government reform hearing on healthcare-associated infections: A preventable epidemic, chaired by henry A. waxman, april 16, 2008, washington, DC. [congressional testimony].
[7]. US Department of Health and Human Services. Guidelines for Prevention of Catheter-Associated Urinary Tract Infections. Atlanta, Ga: Centers for Disease Control and Prevention; 1981.
[8]. 8.Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA, Healthcare Infection Control Practices Advisory Committee. Guideline for prevention of catheter-associated urinary tract infections 2009. Infection Control & Hospital Epidemiology. 2010 Apr;31(4):319-26.
[9]. Thakur A, Jain M, Dogra V, Mishra B, Loomba P. Knowledge and attitude of doctors and nurses regarding indication for catheterization and prevention of catheter-associated urinary tract infection in a tertiary care hospital. Indian Journal of Critical Care Medicine. 2015;19(2):76-81.
[10]. Cooper F, Alexander C, Sinha S, Omar M. Policies for replacing long-term indwelling urinary catheters in adults. Cochrane Database of Systematic Reviews. 2016;2016(7).
[11]. Webster J, Hood RH, Burridge CA, Doidge ML, Phillips KM, George N. Water or antiseptic for periurethral cleaning before urinary catheterization: a randomized controlled trial. Am J Infect Control. 2001;29(6):389–94.
[12]. Cao Y, Gong Z, Shan J, Gao Y. Comparison of the preventive effect of urethral cleaning versus disinfection for catheter-associated urinary tract infections in adults: A network meta-analysis. Int J Infect Dis. 2018;76:102–8