CATHETER CARE USING SOAP AND 10% POVIDON-IODIN

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ABSTRACT

Background: The incidence of bacteriuria due to urethral catheterization is 60%. The occurrence of bacteriuria is caused by some factors, such as the technique and the length of urethral catheterization, disease, age, sex, drainage, and catheter care. **Purpose:** This study aimed to investigate catheters treatment using soap and povidon iodin 10%. **Method:** This research was a quantitative research with quasi experimental design and pretest-posttest control design. The study was conducted in a private hospital in Yogyakarta. The samples were 60 patients with 30 patients in the control group and 30 patients in the intervention group. The analyses employed the statistical test. **Results:** show that the significance value is 0.317 (*p*>0.05). There is no significant difference in the incidence of bacteriuria in the soap group and povidone-iodine 10% group with *p*=0.648. **Conclusion:** there was no significant difference of catheters treated with using soap and povidone iodine 10%.

Keywords: Bacteriuria, Catheter Care, Povidone Iodine 10%, Soap

INTRODUCTION

Urinary tract infections (UTI) are the invasion of pathogenic germs in some or all parts of the urinary tract (kidney, bladder and urethra) commonly caused by bacteria, viruses, and fungi (Gulanick & Myers, 2014; Caljouw *et al.*, 2011). UTI are caused by nosocomial infection. Bacteriuria is the major indicator of urinary tract infection. When the number of bacteria reaches 100,000 CFU/mL (colony-forming units per milliliter) or more, it clinically indicates UTI. The most common type of pathogenic bacteria is Escherichia coli (Lewis *et al.*, 2011; Kozier, 2010).

The incidence of bacteriuria/UTI due to urethral catheterization (extraluminal) is 60%. This can also happen because of the direct inoculation that occurs when the catheter is inserted and or due to bacteria from the urethral meatus rise along the outer surface of the catheter in the periuretra mucosa (Semaradana, 2014; Fink, 2012; Tambyah, 2012). Tenke *et al.* (2008) stated that 95% of patients using long term catheters will have bacteriuria. A similar study conducted by Lo *et al.*, 2014 in the USA shows that 70-80% of the cases of urinary tract infections are caused by the use of catheters.

The occurrence of bacteriuria is caused by some factors, such as the technique and the length of urethral catheterization, disease, age, sex, drainage, and catheter care (Trautner, 2010; Geng, 2012). Masullah *et al.* (2013)

claim that catheter care using povidone-iodine 10% is effective to decrease the colony of Escherichia coli. Povidone-iodine serves as an antiseptic that kills germs. Meanwhile, according to Hooton *et al.* (2010), daily meatal cleansing with povidone-iodine, antibiotic cream and green soap, and water is not recommended for continuous use, in men and women who use catheters with the purpose to decrease the occurrence of bacteriuria caused by urethral catheterization. This is consonant with the guidelines for preventing healthcare-associated infections in primary and community care, (2012) stating that there is no need to do meatal cleansing with antiseptics. It is even said that routine cleansing using antiseptics actually increases the risk of infections. It is recommended to keep meatal hygiene by bathing regularly using water and soap.

Another study was conducted by Wilson *et al.* (2009) in the United States on the Nursing Interventions to Reduce the Risk of Catheter-Associated Urinary Tract Infection. The results show that one of the nursing interventions that could be done to reduce the occurrence of urinary tract infections caused by the use of catheters is to cleanse urethral meatus daily with soap and water, while nursing care interventions of meatal care with antiseptics are not recommended because of the ineffectiveness.

One of private hospital in Yogyakarta, where

catheters were inserted into 5-6 patients in the inpatient rooms (January-March 2015) every day. While in the Emergency Room, catheters were inserted into 2-4 patients every day on average (Survey, January 2016). Currently, the hospital refers to the standard operating procedures of catheter care using povidone-iodine 10% that have been used since 2009. However, based on the observations and information provided by one of the senior nurses in the inpatient rooms, these catheter care procedures are rarely performed. So far, if there is a patient having a catheter, the nurse does not give povidone-iodine 10% but vulva or penis hygiene while the patient is bathing with water and non-antiseptic soap. Based on the phenomenon, the researcher is interested to conduct a research on the effect of catheter care using povidone-iodine 10% and soap on the occurrence of bacteriuria.

Aim of Study

This study aimed to investigate catheter treated using soap and povidon iodin 10%.

METHODOLOGY

It was a quantitative research with a quasi-experimental design and pretest-posttest control design, where independent variable is catheter care, dependent variable is bacteriuria. Confounding variable are age, sex, the use of antibiotics, diabetes mellitus, method of measuring urine output, size of catheters and urethral catheterization technique.

Inclusion and Exclusion Criteria

The inclusion criteria were patient aged between 21-60 years and not suffering from urinary tract infection or urinary system disorders, while the exclusion criteria are patients with decreased consciousness, pregnant patients, and urethral catheterization because of surgeries.

Study Samples

The number of samples in this study was 30 respondents for each group. The samples were taken by accidental sampling, and they were grouped into control and intervention groups randomly.

Ethical Test by the Ethics Committee

The ethical test by the ethical committee was conducted at Padjadjaran University, Bandung Indonesia

Data collection Instrument

The instruments used were questionnaires.

RESULTS

The analyses were done based on sex, age, the medical history of diabetes mellitus, and the medical history of urinary tract infections. the number of the respondents in this study was 60 people. They were evenly distributed into the intervention group (soap) and the control group (PI 10%), 30 people for each group.

Table 1: The frequency distribution of the respondents based on sex among patients with catheters at Private Hospital, Yogyakarta

Sex	Intervention Group		Control Group	
	n	(%)	N	(%)
Ma le	12	40	9	30
Female	18	60	21	70
Total	30	100	30	100

N = 60 : Source: Primary data, 2016

Based on table 1, it can be seen that most of the respondents in both the groups were female i.e. 60% for the intervention group and 70% for the control group.

Table 2: The frequency distribution of the respondents based on age among patients with catheters at Private Hospital, Yogyakarta

Age	Intervention Group		Control Group	
	n	%	N	%
30 -40	1	1.7	1	1.7
41 -50	4	6.7	2	3.3
51 -60	5	8.3	7	11.7
61 -70	8	13 .3	6	10.0
Age	Intervention Group		Control Group	
	n	%	N	%
71 -80	8	13.3	11	18.3
≥ 81	4	6.7	3	5
Total	30	100	30	100

N = 60 : Source: Primary data, 2016

The frequency distribution of the respondents based on age among patients with catheters, most of the respondents in the intervention group were between 61-70 years old and 71-80 years old, as many as 13.3% for each of them. On the other hand, the respondents in the control group were dominated by those aged between 71-80, as many as18.3%.

Table 3: The frequency distribution of the respondents based on the medical history of diabetes mellitus among patients with catheters at Private Hospital, Yogyakarta

	Intervention Group		Control Group	
	N	%	N	%
Without the medical history of DM	25	83.3	24	80
With the medical history of DM	5	16.7	6	20
Total	30	100	30	100

N = 60 : Source: Primary data, 2016

Based on table 3, 83.3% of the respondents in the intervention group and 80% of the respondents in the control group did not have the medical history of diabetes mellitus.

Table 4: The incidence of bacteriuria in the intervention and control groups among patients with catheters at private Hospital, Yogyakarta

Groups	Bacteriuria on the 3rd day				Bacteriuria on the 5th day			
	Positive		Negative		Positive		Negative	
	N	%	N	%	N	%	N	%
Intervention	12	40	18	60	8	61	5	39
Control	11	37	19	63	8	42	11	58

Source: Primary data, 2016

Based on table 4, on third day, the intervention group had more incidence of bacteriuria (40%) than the control group. The similar case also happened on the fifth day where 61.54% of the respondents in the intervention group had bacteriuria.

The incidence of the bacteriuria among more than half (69%) of the respondents in the intervention group was static from the third day to the fifth day. Similarly, for the povidone group, the incidence of the bacteriuria among most of the respondents (95%) was also static. The greater increase happened in the soap group on the fifth day.

The Wilcoxon test shows the significance of 0.317 (p>0.05). Thus, it can be concluded that there is no difference in the incidence of bacteriuria on the third and fifth days among patients treated using either soap or povidone-iodine 10%.

The Mann-Whitney test was carried out to compare the group treated using soap and that treated using povidone-iodine 10% because the data were not normally distributed. The result shows that p=0.526 (p>0.05) which means that there is no significant difference in the incidence of bacteriuria between those two groups.

DISCUSSION

The results show that the proportion of the respondents who experienced bacteriuria on the third day was 40% for the intervention group and 36.7% for the control group, while the proportion of the respondents on the fifth day was 61.54% for the intervention group and 42.1% for the control group. Therefore, it can be concluded that there is a decrease in the proportion of the respondents experiencing bacteriuria on the fifth day compared to the third day in both groups. The number of respondents experienced bacteriuria has decreased more in the control group, the group receiving catheter care using povidone-iodine was 10%. However, if it is seen from the incidence of bacteriuria on the third day compared to that on the fifth day in the group treated using soap, the number has increased as many as 23%, and the other 69% is static. On the other side, in the group treated using povidone-iodine 10%, there is an increase of the incidence of bacteriuria as many as 5%, and the rest of it (95%) is static.

The length of using catheters increases the incidence of bacteriuria among patients. Although the results of this study are not significant (p=0.317) for each group, the length of using catheters shows an increase in the incidence of bacteriuria. This is consonant with Hidayat's study (2015) on the correlation between the length of using catheters and the occurrence of urinary tract infection. This study proves that there is a significant correlation between the length of using catheters and the occurrence of urinary tract infections with p=0.00. Similarly, the results of the research conducted by Putri, Armiyati & Supriyono (2012) prove that the length of using catheters has a significant effect on the occurrence of urinary tract infections with p=0.001, and the length of using catheters is the most dominant factor. It is said that patients who use catheters for more than 3 days have a risk of 56.07 times of having urinary tract infections than those using catheters for less than 3 days. A similar study has also been carried out by Fitriana (2015) claiming that there is a significant correlation between the length of using catheters and urinary tract infections. On the contrary, a research carried out by Jeong *et al.* (2010) shows that there is no difference in the incidents of bacteriuria among patients treated using water and soap in the first, second, and fourth weeks.

The occurrence of bacterial colonies in the urinary tracts among patients using closed catheter system comes from the perianal area. Therefore, lowering bacterial colonies in the meatus by cleansing the area becomes the most important factor.

Statistically, the incidence of bacteriuria in both groups is not significantly different (p=0.648 on the third day and p=0.735 on the fifth day). Based on the evidence, cleaning the meatus area with soap and water regularly prevents the occurrence of bacterial colonies. It is not recommended to clean the meatus area routinely using antiseptics because it increases the bacterial colonies. Povidone-iodine 10% is not recommended although it has the advantage of killing bacteria rapidly and effectively for perianal cleansing. Nevertheless, it causes irritation and is rapidly inactivated by body fluids (Susantiningdyah, Kurniawati & Sriyono, 2019).

The results of this study indicate that there is no difference between the two groups. This is in accordance with the systematic review conducted by Fasugba *et al.* (2019) stating that there is no statistical difference between the use of sterile water and povidone-iodine or chlorhexidine toward the occurrence of urinary tract infections. In the same way, a systematic review and meta-analysis performed by Fasugba *et al.* (2017) also finds no significant difference in the use of antiseptics and non antiseptics toward the occurrence of urinary tract infections.

CONCLUSIONS

Statistically, there was no significant difference of catheter treatment with using soap and povidone iodine 10% to reduce bacteriuria.

RECOMMENDATIONS

Catheter care using water and soap must be carried among patients with catheters to reduce the incidence of bacteriuria. The standard operating procedures of catheter care must be improved based on the results of this study. A further research with the title of the influence of catheter care using water, povidone-iodine 10%, soap, and chlorhexidine 2% on urinary tract infections can be conducted.

ACKNOWLEDGMENT

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