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Original Article

Effect of wet gauze on relief of acute urinary retention in male patients after cardiac catheterization: a randomized controlled clinical trial

Mohammadtaghi Sarebanhassanabadi [1], Samad Niknahad [2], Zohreh Khavari [1]*, Leila Nasiri [1], Sakineh Ganji [1], Jalal Salehinia [1], Sabereh Mosaddegh Manshadi [1]

[1] Yazd Cardiovascular Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
[2] Shahid Rahnemoun Hospital, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

*** Corresponding Author:**
Address: Afshar Hospital, Jomhouri Blvd., Yazd, Iran. **Postal code:** 8917945556; **Tel:** +983535231421; **Fax:** +983535253335; **Email:** khavaryz394@gmail.com

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Abstract

Objectives: Acute urinary retention (AUR) can occur as a complication after surgery or cardiac catheterization. The aim of this study was to evaluate the effect of wet gauze on relief of AUR in male patients after cardiac catheterization.

Methods: In this randomized controlled clinical trial, 36 male patients developing AUR after cardiac catheterization in Afshar Hospital, Yazd, Iran, were allocated to three groups; 13 patients in the group of immersed gauze in tepid water (40 centigrade), 12 patients in the dry gauze group, and 11 patients in the group without any intervention. The gauze was applied on symphysis pubis area. Elimination of AUR was compared between the three groups using chi-square analysis. One-way analysis of variance was used to find significant differences among the three groups regarding the time of relief from AUR.

Results: The frequency of the relief of AUR was 61.5%, 25 %, and 9.1% in the groups of wet gauze, dry gauze and without intervention, respectively. There was a significant difference in relief of AUR among all groups (P = 0.022). The difference in relief of AUR between wet gauze group and other two groups was significant, too (P = 0.007). There was no significant difference in the time of relief of AUR among the three groups.

Conclusions: According to the results of the study, it can be recommended to apply a gauze immersed in tepid water on the suprapubic area in male patients after cardiac catheterization to relieve AUR.

Keywords: Acute urinary retention; Cardiac catheterization; Randomized controlled trial

Introduction

Cardiac angiography is one of the most important diagnostic methods for the diagnosis of coronary artery disease. Men with heart diseases who are catheterized may develop urinary retention with various causes such as pelvic muscle spasm, benign prostatic hypertrophy, all day bedridden, lack of privacy, and administration of some drugs like morphine sulfate, sedatives and atropine (1-3). Reaction to drugs in the patients undergoing angiography is one of the important causes of urinary retention.

Acute urinary retention (AUR) is an over distention of the bladder that occurs commonly in the postoperative period (4) and it is an emergent

condition which describes sudden inability to urinate with pain in the lower parts of the abdomen (5, 6). AUR can lead to both local and general complications. Retention of urine is a critical condition. Since stasis of urine causes decreasing contractility of urinary bladder muscles, it may increase the pressure in pelvis renal calyx and renal parenchyma, urinary tract infection (UTI), renal calculus, hydronephrosis, renal failure and finally death (7). It is estimated that 10% of men in their 70s and one third of them in their 80s suffer from urinary retention (8). Several studies demonstrated that 10-15% of patients with general anesthesia and 20-25% of patients with local or spinal anesthesia after surgery may develop urinary retention (9).

Men with heart diseases who are catheterized may develop urinary retention with various causes (2). Side effects of drugs in the patients undergoing angiography are one of the important causes of urinary retention (9). A study that conducted in Afshar Heart Center in Yazd, Iran, reported that the prevalence of urinary retention is 11.8% in the patients after cardiac catheterization (10).

Urinary catheterization is a common procedure used in urinary retention. However, because of its complications especially UTI, it has been recommended to be the last procedure (6). Urinary catheterization is reported as the cause of 80% of urinary infections (11). Moreover, urinary tract injuries related to the urinary catheterization increase the risk of infection and bleeding. Also, fear because of pain and dysuria increases retention of the urine in the patients (7). A conducted by Ribby in the United States, indicated that each year, two million people suffer from nosocomial infection of which UTI comprise 35%. It is estimated that the cost of this complication is 4.5-5.7 billion dollars. The duration of hospital admission in the patients with urinary catheterization is twice as much as the patients without the problem (12). Therefore, it is very important to find a novel way with fewer side effects to prevent UTI due to urinary catheterization. This study aimed to determine the effect of placing wet-gauze on the suprapubic region on male patients with urinary retention after cardiac catheterization.

Materials and Methods

In this randomized controlled clinical trial, the participants were selected from among the men with urinary retention after cardiac catheterization who did not have the history of urinary tract disorders or benign prostatic hypertrophy. Patients were admitted to Cardiac Care Unit (CCU) after angiography, and all the facilities and cares provided were similar. The study setting was in the CCU of Afshar Hospital, Yazd, Iran.

Sampling method and allocation was simple random allocation. Exclusion criteria in this study were benign prostatic hyperplasia (BPH), urinary tract disorders and emergency problems after angiography. In the study, 36 male patients affected by AUR after cardiac catheterization were allocated to three groups using True Random Number Generator; 13 patients in group of immersed gauze in tepid water (40 Centigrade), 12 patients in dry gauze group, and 11 patients in group without any interventions. Three groups were matched for age, height and weight. All the patients were monitored for 20 minutes for urinary retention relief. To collect data, a form was designed for the patients' demographic information and filled in through asking questions including age, weight, height, BMI, type of angiography, frequency of angiography, drug use such as beta-blocker, antihistamine, sedative, opioid, antidepressant (which can be effective in urinary retention), history of other diseases and substance abuse.

The other part was for treatment of urinary retention and duration among three groups. All of the procedures were explained for each of the patients and after signing the consent form, the study was started. In the intervention group, wet gauze on the suprapubic was used and dry gauze was used on the same place in the second group and in the third group, no intervention was taken. Second and third groups were as control group. In the study 10×20cm sterile gauzes in tepid water (40 Centigrade) was used to prepare a wet area on suprapubic. Likewise, in the control group, we used 10×20cm dry sterile gauzes (Figure 1).

Patients who did not tolerate urinary retention, urinary catheterization was used for relieving urinary retention. A standard time recorder was used to determine duration of urinary retention. Validity and reliability (r= 0.99) of the study instrument was investigated (10). The Ethics Committee of Shahid Sadoughi University of Medical Sciences approved the current study (the ethics code: IR.SSU.MEDICINE.REC.1392.206220). At the start of the study, informed consents were obtained from the patients and their anonymity and privacy were guaranteed. The present study was reported based on the Consort Statement (13).

Data of the study were analyzed by the statistical package for social sciences (SPSS 19, IBM Corporation, New York, USA). Continuous and categorical variables were reported based on mean ± standard deviation (SD) and proportion. Elimination of AUR was compared between three groups by using Chi-square analysis. One way ANOVA was used to find the significances of the time of removing AUR among three groups.

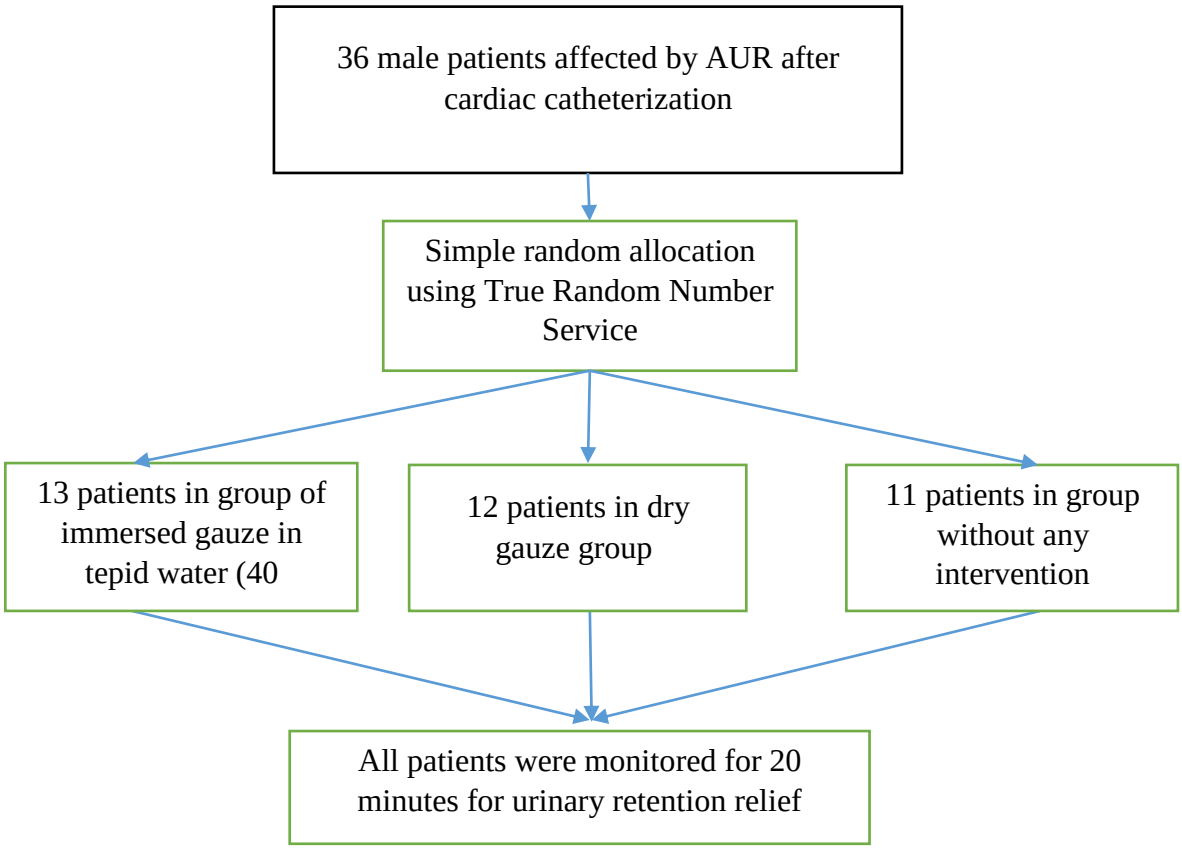

Figure 1. The flow chart of the study phases

Results

The means of the patients' age, weight, height and BMI are summarized in Table 1 .There were no significant differences in variables such as age, weight, height and BMI between three groups (p> 0.05).

Table 2 shows the characteristics of relieving AUR in the three groups of the study. It shows that relieving AUR in wet gauze, dry gauze and control groups is 61.5, 25, and 9.1 percent, respectively. There was a significant difference in relieving AUR among the groups (p= 0.022). There was a significant difference among wet gauze and other two groups based on AUR relief (p= 0.007).

The mean time of elimination of acute retention in wet gauze, dry gauze and control groups was 19, 18.58 and 23.6 minutes, respectively (Table 3). There was no significant difference between three groups based on the time to acute retention relief (p-value = 0.5).

Table1. Demographic characteristics of the participants in the three groups

	Groups			ANOVA
	Wet gauze	Dry gauze	Control	P. value
Age (years)	58.38±12.47	65.41±10.4	58.6±8.5	0.21
Weight	75±12.8	83±11.47	71.36±12.43	0.097
Height	168±14.5	168.1±3.34	166.4±6.9	0.74
BMI	26.8±4.02	28.9±3.07	26.01±5.85	0.27

Table2. Distribution and comparison of relieving acute urinary retention (AUR) across three groups

	Groups						Fisher test
Urinary retention relief	Wet gauze		Dry gauze		Control		P-value= 0.022 $x^2_{=}$ 7.94
	Patients(no.)	Percent	Patients(no.)	Percent	Patients(no.)	Percent	
Yes	8	61.5	3	25	1	9.1	
No	5	38.5	9	75	10	90.9	

Table3. Distribution and comparison of mean time related to relieving acute urinary retention (AUR) across three groups

	Groups						
Time of AUR (min)	Wet gauze		Dry gauze		Control		One-Way ANOVA
	Patients(no.)	Percent	Patients(no.)	Percent	Patients(no.)	Percent	
20-10	10	76.9	9	75	10	90.9	F = 0.69
>20	3	23.1	3	25	1	9.1	P-value = 0.5
Minimum	2		10		20		
Maximum	56		30		60		
Mean	19		18.58		23.6		
SD	14.1		6.4		12.1		

Discussion

The current study has shown that placing wet gauze on the suprapubic region could affect acute urinary retention positively after cardiac catheterization. The treatment rate of AUR in wet gauze, dry gauze and control group was 61.5%, 25 % and 9.1%, respectively and there was a significant difference between wet gauze and others groups in terms of frequency of AUR relief.

Similar to the current study, Seyedalang et al. declared that touch stimulation by pouring lukewarm water over the perineum could affect acute urinary retention, positively (6). Another study showed that relieving AUR in two groups of gauze covered with grated onion and immersed gauze in tepid water were 58.1% and 71 %, respectively (10). Another study using similar methods reported that applying soaked gauze to the suprapubic region relieved 71.4 cases of AUR (14). However, in this study, only 61.5 % 0f our samples experienced urinary retention. This discrepancy among the finding of current study with other studies can be attributed to several factors such as differences in the type of surgery or differences in water temperature. Probably, wet gauze creates urinary retention relief through transmission a sense of exposure with water and affecting the heat reflex of the bladder sphincter (14).

Some nursing techniques were used to prevent urinary retention among the male patients after cardiac catheterization. Most men are comfortable urinating while standing in this position. In addition, they can use the bathroom or bedside commode for voiding. Use of warm water, baths and shower are another ways to relax the sphincters (15). The male patients after cardiac catheterization cannot use these positions because bed rest from 4 to 24 hours is recommended for the patients to prevent complications at the percutaneous femoral arterial approach such as bleeding and hematoma (16). Therefore, it seems that placing wet gauze on the suprapubic region is an effective way in AUR treatment after cardiac catheterization, because its application does not need to change the position of the patients on the bed.

Our previous study showed that there was no significant difference between the efficacies of onion covered gauze in comparison with wet gauze for treatment of AUR. Humidity on the skin of the patients may play a role in AUR treatment (10), but we cannot make it clear that the humidity of gauzes is the main reason of relieving AUR, or the probable useful factors in onion decrease the rate of urinary retention in patients after cardiac catheterization. Therefore, the current study was designed to find out the impacts of wet gauze on the patients after cardiac catheterization. Future studies are recommended to assess the effect of wet gauze for relieving AUR in male patients after cardiac catheterization.

In the current study, the mean time of elimination of urinary retention with a wet gauze was 19

minutes, while Afzal et al. declared that the mean time of elimination of urinary retention in the soaked gauze was 13.70 minutes. This discrepancy in the duration of urinary retention relief can be attributed to type of surgery (14), in addition, our previous study indicated that the mean time of elimination of urinary retention in the soaked gauze was 16.63 minutes (10). There were not any complications in the current study.

There were some limitations in the current study. 1) definition of urinary retention was based on inability to urinate after cardiac catheterization. It was better to measure urinary retention using a simplified ultrasound bladder measurement. 2) In the study, cardiac catheterization was done by several cardiologists. Therefore, different skills for cardiac catheterization might be considered to interpret the results of the study. 3) The number of attempts to access femoral artery for cardiac catheterization was not considered. 4) Drugs used before, during and after cardiac catheterization might be confounder for urinary retention. Therefore, it was better to adjust the effect of the drugs.

Conclusion

According to the results of the current research, it is recommended applying wet gauze on suprapubic region to eliminate the AUR and prevent the complications of catheterization such as trauma, UTI and discomfort in male patients after cardiac catheterization. Therefore, it seems that this method is an effective method in AUR treatment. Furthermore, this method is easy to use and cost-effective.

Conflicts of Interest

There was no conflict of interest in the study.

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