



Investigating the influence of local antiseptics on the level of urinary tract infection (UTI) among patients undergoing transrectal biopsy of prostate

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ABSTRACT

Transrectal ultrasound guided biopsy of the prostate is the most common modality used to diagnose prostate cancer. The main complication of this modality is prostatitis. The purpose of this study is to determine the effect of simple use of suppository povidone-iodine on infectious complications after transrectal ultrasonography-guided biopsy of the prostate. In a randomized clinical trial, 300 patients are included and received antibiotic prophylaxis. Among them, 150 patients received povidone-iodine suppository five minutes prior to biopsy (group 1) and 150 patients did not (group 2). Infectious complications were compared in two groups. Urinary tracts infection were not detected in the rectal preparation group (Group 1) and developed in 13 cases (8.8%) in the non-rectal preparation group (Group 2) (odds ratio=0.912; $P<0.001$). Prostatitis was not detected in the rectal preparation group (Group 1) and developed in 13 cases (8.8%) in the non-rectal preparation group (Group 2) (odds ratio=0.912; $P<0.001$). Povidone-iodine into the rectum and decreased the bacterial colony count. Simple use of povidone-iodine suppository before prostate biopsy minimizes the risk of infectious complications.

Key words: transrectal Sonography, transrectal Biopsy, Prostate, Antiseptic, Prostatitis.

INTRODUCTION

Prostate complications are among the most common diseases among men around the world which affect their life quality [1-2]. Despite the high death toll of prostate cancer, the majority of the cases are sub-clinical and most of the patients exhibiting the symptoms are in the advanced level of the disease [3-4]. Thus, early diagnosis of the disease is very important [5]. For screening and early diagnosis of the prostate cancer and determination of the malignancy stage to come up with the therapeutic plan, Prostatic Specific Antigen (PSA), finger rectal exam (Digital Rectal Exam-DRE), Transrectal Ultrasonography-TRUS in the suspicious cases, decuple biopsy and determination of Gleason Score are some of the methods utilized [6-7].

Over the last years and due to the development of PSA (Prostatic Specific Antigen) tests, more suspicious cases of the prostate cancer are discovered during the screening and prostatic biopsy is required to reject or detect prostate cancer [8]. Although the histo-pathological analysis of prostate is the golden standard for detecting the diseases and cancers of prostate and determination of its stage, this has some complications as biopsy through prostate is invasive. The most important of such complications are Prostatitis and other acute bacterial infections [6]. Infection of the site with various bacteria and removing a large number of tissue samples from the prostate are the main risk factors of UTI caused by prostate biopsy [9].

Recent years have witnessed the attraction of doctors' attention to UTI Prophylaxis after prostate biopsy [10-11]. Considering the deterioration and complications of acute bacterial Prostatitis, this issue has turned into one of the priorities in medical researches conducted in the field of urology and radiology [12]. The present research is

conducted as a thesis proposal of residency to determine the prevalence of urinary tract bacterial infection following prostate biopsy and to study the influence of using local antiseptic utilizing the simple and cheap method of soaking the biopsy site with Betadine.

MATERIALS AND METHODS

This is an analytical research conducted in the form of a clinical trial with the witness group in 2011 in Hasheminejad Hospital of Tehran. The population studied included all the patients candidate for prostate transrectal sampling. Those patients whose follow up was not possible, those unnatural tests or urine cultivation before the biopsy, those patients on whom the application of the local antiseptics was not possible and those who had undergone Prostatectomy were excluded from the research.

To calculate the sample volume, the equation for comparing an attribute within two populations was utilized. Considering the ratio, the frequency of urinary tract infection in a similar population with and without using antiseptic methods was 1 and 5 percent respectively [10]. Considering the first type of error (alpha) and the second type of error (0.05 and 0.20 respectively), the sample volume in each group was set to 150.

Each sample qualified for the research was provided with full information concerning the method and goals of the research and their informed consent was gained. Then, the information required including age, PSA and prostate volume and the result of full urinary tests before biopsy were determined. Before biopsy, antibiotics prophylaxis protocol was undertaken for all patients as follows: 20 Metronidazole 250 mg taken in TID form, 20 Ciprofloxacin 500 mg taken in BID form three days before the biopsy and they continued to be taken after biopsy. One hour before biopsy, 500 mg of IV amikacin and 1 g of IV Ceftazidime were injected. The patients were randomly divided into 2 groups including the groups with (group 1) and without (group 2) local antiseptic. In the first group, 80 g Betadine 80% gel plus 25 g Lidocaine 2% gel were placed inside the rectum using Gavage syringe and after 5 minutes, 10 biopsy samples were taken under transrectal sonography. Sampling in the second group was also conducted without local antiseptics. The operation team was the same for both groups. 48 hours later, the urine samples were taken from the patients for full urine test and urine cultivation and the patients' fever was checked. The results achieved for both groups were compared against one another based on the goals of research.

Average, mean, index and standard deviation were used to statistically analyze and display the quantitative variables, while frequency and ration were utilized to represent the qualitative variables. T-test was used to compare the means, while Chi-square was utilized to compare the ratios. The statistical significance limit in this study was 0.05 and SPSS v.15 was used as the statistical software.

RESULTS

Some 300 patients including 150 in the Betadine and 150 in the witness groups entered the study. Table 1 compares the background variables in both group 1 (Betadine) and group 2 (witness). As the content of the table shows, the average age of the patient, the average size of prostate, average PSA and the ratio of malignancy in both groups did not show any significant difference.

Table 1. A comparison of background variables in the Betadine and witness group

variable studied	group 1 (Betadine) (n=150)	group 2 (witness) (n=150)	P-value
average age (years)	65.7 ± 8.4	66.7 ± 9.4	0.325
average prostate size (mm)	59.5 ± 30.4	58.9 ± 28.3	0.871
average PSA	12.7 ± 4.4	14.8 ± 6.3	0.503
the frequency and ratio of malignancy	48 (32%)	46 (30.7%)	0.791

As the results indicate, post-biopsy UTI has not been positive in any of the patients in group 1, while it was positive among 13 patients in group 2 (8.8%) (odds ratio = 0.912; P<0.001). No Prostatitis was observed among any of the patients in group 1, while it was positive among 13 (8.8%) patients in group 2 (odds ratio = 0.912; P<0.001). No fever was reported among any patient in group 1, while 13 (8.8%) cases of fever were recorded in group 2 (odds ratio = 0.912; P<0.001). The comparison of these ratios has demonstrated statistically significant differences.

Table 2 presents the frequency of Prostatitis, fever and UTI in both Betadine and witness groups based on the state of malignancy, benignity, age and prostate size.

Table 2. A comparison between the prevalence of Prostatitis, fever and UTI in group 1 (Betadine) and group 2 (witness) based on the state of malignancy, age, and prostate size

background variable	variable studied	group 1 (Betadine) (n=150)	group 2 (witness) (n= 150)	P-Value
benign	Prostatitis	0	10 (9.8%)	0.001*
	fever	0	10 (9.8%)	0.001*
	UTI	0	10 (9.8%)	0.001*
malign	Prostatitis	0	3 (6.7%)	0.075
	fever	0	3 (6.7%)	0.075
	UTI	0	3 (6.7%)	0.075
prostate size equal to or less than 75 mm	Prostatitis	0	0	-
	fever	0	0	-
	UTI	0	0	-
prostate size more than 75 mm	Prostatitis	0	13 (26.5%)	0.004*
	fever	0	13 (26.5%)	0.004*
	UTI	0	13 (26.5%)	0.004*
aging less than 65 years old	Prostatitis	0	3 (4.4%)	0.072
	fever	0	3 (4.4%)	0.072
	UTI	0	3 (4.4%)	0.072
aging 65 years or older	Prostatitis	0	10 (12.7%)	0.001*
	fever	0	10 (12.7%)	0.001*
	UTI	0	10 (12.7%)	0.001*

DISCUSSION AND CONCLUSION

150 patients were studied in this research in each group. This number was sufficient for a trial research with the specifications of this study and has given a large capability to this research. As the findings indicate, the background variables of this research including the age of the patient, mass size, PSA values, and the ratio of malignancy in both the Betadine and witness groups exhibited no significant difference and these variables could not distort the results. As the results of this research indicate, the prevalence of Prostatitis, fever and UTI among the patients of Betadine group was significantly less than the witness group and prevention using Betadine gel significantly reduced the risk of UTI. This decrease is witnessed in all age groups, within malign and benign patients and also among the majority of various prostate sizes. The main reason describing why P-value in the malign and among those aging less than 65 was more than 0.05 is the small volume of the sample studied in these groups. However, the P-value in these groups was noticeable and close to the statistically significant level.

The results of our research are in line with the few researches conducted on this issue. In the study conducted by Park, it was shown that the frequency of UTI, Prostatitis, fever and Sepsis after biopsy among the prophylaxis with Betadine group was significantly less than the witness group[11]. Although we do not have access to more studies concerning the influence of Betadine in preventing infection after prostate biopsy, the sum of our research points to the preventive influence of Betadine on UTI after prostate biopsy. As utilizing Betadine is a simple and cheap method without any complications, using this method is also acceptable in terms of cost-benefit equivalence.

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