Characteristics of Patients Who Visited the Emergency Room after Prostate Biopsy: Single Center Retrospective Study

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Purpose: To educate patients and prevent biopsy-related complications, it is helpful to understand the causes for visiting the emergency room (ER). Therefore, we want to analyze the causes and factors of complications that cause patients to visit the ER after prostate biopsy.

Materials and Methods: We conducted a study of in-patients who visited the ER of Pusan National University Yangsan Hospital after prostate biopsy from December 2008 to July 2015. Age, postoperative interval before visiting the ER, Charlson comorbidity index (CCI) score, symptoms in ER, prostate size, pathologic result, and number of biopsy cores were analyzed retrospectively.

Results: Among all 1,694 cases of patients who had undergone prostate biopsies during a 7-year period, only 37 patients (2.2%) visited the ER. Diabetes mellitus (DM) is the most common underlying disease among patients with accompanying infection-related symptoms compared to patients with accompanying non-infection-related symptoms (p < 0.001). In univariate analysis, DM (p=0.004) and CCI score (p=0.030) were statistically significant risk factors for infection, but only DM was significant in multivariate analysis (p=0.004). Prostate size (p=0.044) was a significant risk factor for acute urinary retention (AUR) in univariate analysis, but not statistically significant in multivariate analysis. CCI score was a statistically significant risk factor for bleeding (p=0.005 [univariate], 0.035 [multivariate]).

Conclusions: AUR after transrectal ultrasound-biopsy is the most common reason for visiting the ER. CCI score showed correlation with bleeding and DM showed correlation with infection. Consideration of risk factors of complications after prostate biopsy will be helpful to the patients in the treatment and prevention of complication.

Keywords: Infection; Diabetes mellitus; Comorbidity; Biopsy; Prostate

INTRODUCTION

Prostate cancer (PCA) is the most frequently diagnosed cancer among males in western countries. In South Korea, incidence of PCA has shown a continuous increase, because of the rapid increase of the aged population and westernization of diet. Transrectal ultrasound (TRUS)-guided prostate biopsy is the standard procedure commonly performed for patients with elevated prostate-specific antigen (PSA ≥ 4 ng/ml) or abnormal digital rectal examination. The benefits and risks of prostate biopsy for PCA screening and treatment are under debate. Although minor complications such as
voiding difficulty, dysuria and bleeding are frequent, major complications are not common after prostate biopsy [1]. In the majority of cases, prostate biopsy was performed in the outpatient setting. Patients who developed a complication visited the emergency room (ER). The objective of this study was to analyze the causes and factors of complications that cause patients to visit the ER after TRUS-guided prostate biopsy.

**MATERIALS AND METHODS**

Our study was conducted on 37 patients who visited the ER after prostate biopsy among all patients who underwent TRUS-guided prostate biopsy from December 2008 to July 2015 at Pusan National University Yangsan Hospital (Yangsan, Korea).

We compared and studied three complications: infection-related symptoms, acute urinary retention (AUR), and bleeding such as hematuria or rectal bleeding. In our study, the Charlson comorbidity index (CCI) was used as an indicator of comorbidity. CCI was stratified according to four categories: 1: CCI=0 (control), 2: CCI=1, 3: CCI=2, 4: CCI≥3 [2]. The risk factors following TRUS-guided prostate biopsy included age, PSA, prostate size, PCA, diabetes mellitus (DM), and CCI score.

We respectively analyzed and compared age, interval to revisit ER after prostate biopsy, CCI score, symptoms in ER, prostate size, the relevance of the PCA and the number of biopsy cores, using PASW ver. 18 software (IBM Co., Armonk, NY, USA). Relative risk was calculated using chi-square and logistic regression tests.

This study was approved by the Institutional Review Board of Pusan National University Yangsan Hospital (IRB 05-2015-011).

**RESULTS**

During our 7-year single institutional study, 1,694 TRUS-guided prostate biopsies were performed. Among the cases, 37 patients (2.2%) visited the ER within 2 weeks postoperatively. The mean age of patients who visited the ER after prostate biopsy was 66.8±1.3 years, mean prostate size was 50.0±2.7 ml, and mean PSA was 17.7±4.6 ng/ml. The mean CCI score was 3.8±0.2 points.

Among patients who visited the ER after prostate biopsy, 17 patients (45.9%) were diagnosed with PCA. After prostate biopsy, mean interval to visit the ER was 3.4±0.6 days. TRUS-guided prostate biopsy was performed in the outpatient setting, except one patient in whom it was performed during hospitalization.

Eight patients complained of hematuria, one of whom also complained of rectal bleeding. Three patients among eight patients were hospitalized because of severe bleeding and anxiety. The one patient with accompanying rectal bleeding required indwelling of a Foley catheter, and squeezing the area with gauze, the patient was hospitalized in the gastroenterology division. Thirteen patients complained of AUR, three of whom were hospitalized after receiving an indwelling Foley catheter, and 10 patients were discharged to the ER after receiving an indwelling Foley catheter or using a Nelaton catheter.

Six patients complained of fever and myalgia, three of whom complained of neurological abnormality such as syncope at the same time were diagnosed with stroke and hospitalized in the department of neurology; among these, one patient who complained of chest pain showed no abnormal findings. Three patients were hospitalized in the Department of Urology.

Six patients complained of nausea and dizziness, but there were no abnormal findings in evaluation. After hydration and taking absolute rest, the symptoms were relieved, so that all six patients were discharged.

Four patients who complained of dysuria were discharged after pain control.

None of the patients underwent transfusion, and the patient with accompanying rectal bleeding did not undergo endoscopic management; after squeezing, the symptoms were relieved.

After primary treatment, 25 patients (67.6%) were discharged and 12 patients (32.4%) were admitted to hospital. The symptoms of admitted patients were fever (6), AUR (3), hematuria (2), and rectal bleeding with hematuria (1), among whom one patient died despite administration of broad-spectrum antibiotics.

DM is the most frequent underlying disease among patients with accompanying infection-related symptoms compared to the patients with accompanying non-infection-related symptoms (p<0.001) (Table 1). DM (p=0.004) and CCI (p=0.030) were statistically significant risk factors for infection in univariate analysis.
however, in multivariate analysis only DM was a significant risk factor for infection (p=0.004) (Table 2).

Prostate size (p=0.044) was a significant risk factor for AUR in univariate analysis but not in multivariate analysis (Table 3).

CCI score was a statistically significant risk factor for bleeding (p=0.005, 0.035) (Table 4).

**DISCUSSION**

TRUS-guided prostate biopsy is a standard procedure commonly performed for patients with elevated PSA ≥4 ng/ml or abnormal digital rectal examination. As the incidence and prevalence of PCA increase, concern over prostate biopsy-related complications is rising. One patient among six patients who complained of fever and myalgia died, despite administration of broad-spectrum antibiotics. In our single institutional 7-year study, sepsis-related mortality after...
prostate biopsy was 0.06%. This result is lower than the three-country (Finland, Netherlands, and Sweden) European Randomized Study of Screening for Prostate Cancer (ERSPC) trial rate of 0.24% [3]. It is also lower than the 0.13% sepsis-related mortality reported by Wei et al. [4].

Previous studies have reported an extremely minimal sepsis-related mortality rate following TRUS biopsy. PCA can be detected in the early stage by TRUS-prostate biopsy, thus it may reduce mortality of individuals diagnosed with PCA. Among 1,694 TRUS-guided prostate biopsies, 37 patients (2.2%) who visited the ER within two weeks were the subject of our study. In our study, 17 patients (45.9%) were diagnosed with PCA, much higher than the 32.3% in the PLCO trial [5], the 17.1% in the Surveillance Epidemiology and End Result study (SEER) [6], and the 36% reported by Wei et al. [4]. This may be due to the limited scope of the current study.

Infection is a well-established risk of TRUS-biopsy [7]. We studied two major complication types following TRUS prostate biopsy: infection-related symptoms and non-infection symptoms.

The rates of these complications were 16.2% and 83.8%, respectively.

Findings of our study using the entire prostate biopsy cohort showed fever or myalgia (0.35%), AUR (0.77%), and bleeding (0.47%). This was lower than the 6.59%, 9.76% and 1.14% by Wei et al. [4], who reported that AUR was most common among postoperative complications, Loeb et al. [6] reported bleeding as the most common symptom after prostate biopsy. However, in our study, AUR was the most common. These symptoms were minor and resolved spontaneously except for those of three patients hospitalized after receiving an indwelling Foley catheter or using a Nelaton catheter. On the other hand, infection-related symptom (0.35%, 16.2%) was the least common cause of the ER visit, but the most common symptom among patients in hospitalization. The infection complication rate in the Rotterdam section of the ERSPC was 4.2% [8], higher than our study. Among the 72,500 biopsies performed in the United Kingdom, 2.15-3.6% patients were readmitted because of infection-related complications [9]. In the Global Prevalence Study of Infections in Urology, 3.5% of patients complained of febrile UTI, and 3.1% required hospitalization after prostate biopsy [10].

Simsir et al. [11] reported a similar frequency of 3.06%. However, other studies from North America [12,13] reported lower rates of sepsis (0.6%), and an Asian study [14] reported that 0.5% of prostate biopsy cases had fever, similar to the data of our study.

An Asian study reported no septic complications [15]. Infection-related complications after prostate biopsy have been an increasing issue, and numerous strategies have been evaluated to reduce the risk of complications. Assessment of risk factors for infection and antibiotics resistance, thorough history, and physical examination was recommended [16]. Earlier studies reported that risk factors of infection-related complications were DM [8,11,17-19], comorbidities [6], more biopsy cores [11,20-22], and repeat biopsy [11,16, 23]. Significant risk factors for fever after TRUS biopsy included prostate size and DM in the Rotterdam section of the ERSPC trial [8]. In the SEER study, Loeb et al. [6] reported that significant risk factors included nonwhite ethnicity and higher comorbidity scores.

In our study, DM (p=0.004), and CCI (p=0.030) were statistically significant risk factors for infection in univariate analysis; however, in multivariate analysis, only DM was
a significant risk factor for infection (p=0.004).

Earlier studies reported that the complication rate of AUR after prostate biopsy ranges from 0.2% to 1.7% [12,24-30]. Raaijmakers et al. [31] reported that risk factors of urinary retention after prostate biopsy included prostate size, ratio of transition zone size to total size, and an IPSS. Zaytoun et al. [26] and Chiang et al. [32] reported that prostate size predicted AUR after prostate biopsy. On the other hand, in our study, prostate size (p=0.044) was a significant risk factor for AUR in univariate analysis but not in multivariate analysis (p=0.075).

Gross hematuria after TRUS-biopsy is common, and the reported rate of complication was 10-84% [2,8,16] because of different definitions for hematuria. Another study reported that hematuria lasting > 3 days was seen in 22.6% and had relevance to prostate size (r=0.096; p<0.001) and transition zone volumes (r=-0.076; p<0.001) [31]. Others have also reported increased hematuria with larger prostate volume [26].

In our study, CCI score was a statistically significant risk factor for bleeding (p=0.005 [univariate], 0.035 [multivariate]). We know that there was a problem comparing our study to earlier studies, due to difference in scope. In our study, the possibility that patients with complication after prostate biopsy visited other hospitals with ER or visited outpatient clinics was overlooked.

CONCLUSIONS

We concluded that AUR after TRUS-biopsy is the most common complication. CCI score showed correlation with bleeding and DM showed correlation with infection. Referring to risk factors of complications after prostate biopsy will be helpful to the patients in the treatment and prevention of complications.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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REFERENCES


