Is Antibiotic Prophylaxis Necessary Before Transrectal Ultrasound-Guided Prostate Biopsies?

Transrektal Ultrason Rehberliğinde Yapılan Prostat Biyopsileri Öncesinde Antibiyotik Profilaksisi Gerekli midir?

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ABSTRACT To evaluate the necessity of antibiotic prophylaxis and to determine the type of microorganisms detected in blood and urine cultures after transrectal ultrasound (TRUS)-guided prostate biopsies are aimed in this study. The study group included 28 men who had undergone TRUS-guided 8 core systematic prostate biopsy. Patients did not use Fleet enema or any antibiotic prophylaxis before the biopsy procedure. Blood cultures were obtained 5 minutes after the biopsy procedure, whereas urine cultures were obtained after 30 minutes. In order to determine infection rates, results of the blood and urine cultures were evaluated and then oral ciprofloxacin was started just after the cultures. *Escherischia coli (E. coli)* was identified in the urine cultures of 2 (7%) patients. Pathogenic microorganisms were identified in the blood cultures of a total of 8 (28.6%) patients: *E.Coli* in 7 (25%) patients; and group *B streptococcus* in 1 (3.5%) patient. After TRUS-guided transrectal prostate biopsy *E. coli,* were identified at blood cultures with a high rate. These results show that antibiotic prophylaxis which is effective on *E. coli* is neccessary before TRUS-guided prostate biopsy.

Key Words: Prostate biopsy, TRUS, complications, antibiotic prophylaxis

ÖZET Transrektal ultrason (TRUS) rehberliğinde yapılan prostat biyopsileri sonrasında kan ve idrar kültürlerinde saptanan mikrorganizma tiplerinin belirlenmesi ve antibiyotik profilaksisinin gerekliliğinin değerlendirilmesi amacı ile çalışmamız planlanmıştır. Çalışma grubunu TRUS-rehberliğinde transrektal yolla 8 kor sistematik prostat biyopsisi uygulanan 28 erkek oluşturmuştur. Hastalara biyopsi işlemi öncesinde Fleet enema veya antibiyotik profilaksisi uygulanmamıştır. Kan kültürleri biyopsi işleminin 5 dakika sonrasında alınırken idrar kültürleri işlemden 30 dakika sonra elde olunmuştur. Enfeksiyon oranlarını belirlemeye yönelik olarak, kan ve idrar kültür sonuçları değerlendirilmiş olup kültürlerden hemen sonra oral siprofloksasin başlanmıştır. Olguların 2'sinin (%7) idrar kültürlerinde *Escherischia coli (E. coli)* saptanmıştır. 7 (%25) hastada *E. coli* ve 1 (%.3.5) hastada *B grubu streptokok* olmak üzere toplam 8 (28.6%) hastanın kan kültürlerinde patojenik mikroorganizmalar belirlenmiştir. TRUS rehberliğinde prostat biyopsisi sonrasında, kan kültürlerinde büyük çoğunluğu *E. coli* olmak üzere yüksek oranda patojenik mikroorganizmalar saptanmıştır. Bu sonuçlar TRUS rehberliğinde prostat biyopsisi öncesinde özellikle *E. coli* üzerinde etkili antibiyotik profilaksisinin gerekli olduğunu göstermiştir.

Anahtar Kelimeler: Prostat biyopsisi, TRUS, komplikasyonlar, antibiyotik profilaksisi

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Transrectal ultrasound (TRUS)-guided prostate biopsy which is the most commonly used procedure for detecting prostate cancer is considered safe and can be performed in an outpatient setting. Apart from the very rare severe complications such as sepsis, urinary tract infec-

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tion, severe rectal bleeding or hematuria and urinary retention reportedly seen in 0.1-1.2 of patients, relatively frequent and self-limiting minor complications like perineal pain, transient mild hematuria, and rectal bleeding with a prevalence of up to 60% are the major constituent of the associated morbidity.[1-3] Increased number of cores suggested to be biopsied within the scope of recent sampling protocols aiming to increase the detection rate of prostate cancer has been suggested to be associated with an increase in the relevant complication rate.[4] In this regard, close monitoring for the associated morbidity seems to be necessary as the suggested number of cores per gland has been steadily increasing.

The infectious complications associated with TRUS-guided biopsy include asymptomatic bacteriuria, pyrexia, symptomatic urinary infection and sepsis.[5] Different antimicrobial regimens have been used and the prophylactic treatment is variable. Although antibiotic coverage with prostate biopsies is given almost universally there remains a lack of prospective randomized trials to support this practice.[6] In this study, we aimed to evaluate the necessity of antibiotic prophylaxis and to determine the type of microorganisms detected at blood and urine cultures after TRUS-guided prostate biopsies.

MATERIAL AND METHODS

This prospective study included 28 consecutive men with a mean age of 65.1 and with PSA values between 4-10 ng/ml who have undergone prostate biopsy. The biopsy indications were elevated PSA values and positive digital rectal examination. Informed consent was obtained for each patient. The patients didn't use rectal enema before the procedure. No antibiotic prophylaxis was used before the biopsy. All patients had 8 core TRUS-guided biopsy using an automatic spring loaded device with an 18 G needle and ultrasound system equipped with a biplane probe with a 6 MHz end-fire convex transducer and a 7 MHz side-fire lineer transducer (Toshiba SSA 250A, Tokyo, Japan). The probe was covered by a latex condom and ultrasound gel was used to eliminate the rectal air artifact. A stabilizing needle guide was attached to the transrectal probe. For all patients, 8 core systematic sampling was performed in all patients, which included sampling of the base, mid-prostate and apex of the prostate in parasagittal plane on each side as well as sampling of the lateral regions of the mid-prostate region bilaterally. Biopsies were performed by the same experienced radiologist (E.Ö). Urine and blood cultures were taken 30 minutes after the biopsy which was followed by intake of 500 mg oral ciprofloxacin (continued twice daily for 3 days after the procedure) and intramuscular injection of gentamycin (80 mg) for all patients.

RESULTS

The urine and blood culture results of the patients are given in Table 1. *Escherischia coli (E. coli)* was

TABLE 1: Results of urine and blood cultures.

Patient no	Urine Culture	Blood Culture
1	-	E. coli
2	-	-
3	-	-
4	-	-
5	E.coli	-
6	-	-
7	-	E.coli
8	-	-
9	-	E.coli
10	-	-
11	-	-
12	-	-
13	-	Group B Streptoccoccus
14	-	-
15	E.coli	-
16	-	E.coli
17	-	-
18	-	-
19	-	-
20	-	-
21	-	-
22	-	E. coli
23	-	-
24	-	E.coli
25	-	-
26	-	-
27	-	E.coli
28	-	-
toplam	2	8

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identified in the urine cultures of 2 (7%) patients. Pathogenic microorganisms identified in the blood cultures of 8 (28.6%) patients were *E. coli* for 7 (25%) patients and *group B streptococcus* for 1 (3.5%) patient respectively. None of the patients had high fever after the biopsy procedure. Totally, pathogenic microorganisms were identified in 10 of 28 patients (35.72%).

DISCUSSION

Despite having been determined to be essential before TRUS-guided prostate biopsies and usually consists of an oral fluoroquinolone administered 2 hours before the procedure and continued for 24 to 48 hours after the procedure, some researchers have claimed that prophylactic antibiotics were not necessary.[7,8] In a previous study, Enlund et al.[8] reported a rate of only 2.9% for fever severe enough to necessitate medical treatment among the patients included to their study who did not use prophylactic antibiotics. The authors concluded that antiobiotic prophylaxis before TRUS-guided biopsy was unnecessary. However, TRUS-guided prostate biopsy without antibiotic prophylaxis was associated with a high rate of positive urine and blood cultures in several other reports. In a previous study by Isen et al.[9], prophylactic use of single dose of oral ofloxacin or trimethoprim-sulfamethoxazole regimens was reported to result in urinary infection rates ranging from 0.7% to 4%, whereas the same rate was calculated to be 26% in the control groups. In another study, Lindert et al.[10] reported that of 50 patients undergoing TRUS-guided biopsy, 44% were determined to have bacteriuria and 16% had bacteriemia on postprocedure culture analysis. In a similar study, Aaron et al.[11] reported that urinary system infections were statistically higher according to the blood and urine cultures in patients who did not use antibiotic prophylaxis in comparison with the patients taking oral cyprofloxacin and tinidazol.

In our study group, urine cultures revealed that *E. coli* was identified in only 2 (7%) patients, whereas both *group B streptococcus* and *E.coli* were identified in blood cultures of 1 (3.5%) and 7 (25%) patients, respectively. Thus, there were a total of 8 patients (28.6%) with positive blood cultures in our series. Importantly, these findings reveal that antibiotic prophylaxis is neccessary before TRUS-guided prostate biopsy and that the antibiotic used should mainly be effective on *E. coli*. In a previous study by Sieber et al.[5], it was reported that 5 patients presented with symptomatic urinary tract infection after TRUS-guided biopsy, with the urine cultures yielding *E. coli* totally.

While asymptomatic bacteriuria has been reported to be associated with *bacterioides* and *enterococcus*, symptomatic infections are mainly caused by *E.coli* and *enteroccoccus*.[5] Therefore, suggested antibiotic prophylaxis include fluoroquinolones and metronidazole. Quinolones, gentamycin, trimetophrim/sufamethozasole and metronidazole are generally given alone or in various combinations. Meanwhile, some authors argue that quinolones have better penetration capability for the prostatic tissue and would therefore be preferable in the setting of prostatic biopsy.[6]

The lack of any preprocedural urine or blood culture can be regarded as a limitation of the current study as any pre-existing infection would result in positivity of the post-procedural cultures. Another drawback was the limited number of patients included to the study.

In summary, the optimal prophylactic antibiotic regimen and the ideal length of antibiotic prophylaxis yet remain undetermined. However, our results suggest that pathogenic microorganisms, the great majority of which is *E. coli*, are identified in blood and urine cultures with a high rate after TRUS-guided prostate biopsy. Therefore, we conclude that preprocedural antibiotic prophylaxis which should mainly be effective on *E. coli* may be useful in patients undergoing TRUS-guided prostate biopsy.

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