The Efficacy of Antibiotic Prophylaxis in Transrectal Biopsy of Prostate: A Prospective Randomized Study of Single Dose Oral Fluoroquinolone Versus Trimethoprim-Sulfamethoxazole

TRANSREKTAL PROSTAT BİYOPSİSİNDE ANTİBİYOTİK PROFİLAKSİSİNİN ETKİNLİĞİ: TEK DOZ ORAL FLUROKİNOLON İLE TEK DOZ ORAL TRİMETOPRİM-SULPHAMETOKSAZOL'ÜN KARŞILAŞTIRILDIĞI PROSPEKTİF RANDOMİZE BİR ÇALIŞMA

Kenan İSEN*, Bora KÜPELİ*, Zafer SINIK*, Hasan BİRİ*, Sinan SÖZEN*, İbrahim BOZKIRLI*

* Dr.,Dept. of Urology, Gazi University Faculty of Medicine, Ankara, TURKEY

Summary

We studied 110 patients undergoing transrectal biopsies to determine the need of antibiotic prophylaxis for the biopsy of prostate and to compare the efficacy of single dose (400 mg) oral ofloxacin versus single dose (160 mg + 800 mg) oral trimethoprim - sulfamethoxazole. Patients were randomly assigned into 3 groups. Of the 23 patients who had not received antibiotic prophylaxis, urinary infection was found in 6 (26.08%). Of the 42 patients who received ofloxacin, urinary infection was found in 2 (4.76%) and of the 45 patients who received trimethoprim - sulfamethoxazole, urinary infection was found in 3 (6.66 %). There were a reduction in urinary infection in groups which received antibiotic regimens, however, it was not a statisticially significant reduction in urinary infection (p >0.05, p> 0. 05). This result may be due to the low numbers of patients in each group and and the subject should be investigated in larger groups.

Our study indicate that the prophylactic antibiotic causing low rate of clinical post-biopsy infections. Although the selection of the antibiotic regimen depends on the clinical practice, the use of a fluoroquinolone or trimethoprim - sulfamethoxazole for this purpose seems to be effective, practical and economical.

Key Words: Transrectal prostate biopsy, Antibiotic prophylaxis, Ofloxacin, Trimethoprim-Sulfamethoxazole, Infection

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Özet

Transrektal iğne biyopsisi yapılan 110 hastada profilaktik antibiyotik uygulamasının gerekliliği araştırıldı ve tek doz (400 mg) oral ofloksasin ile tek doz (160+800) oral trimetoprim-sulfametoksazol'ün profilaktik etkinliği karşılaştırıldı. Hastalar randomize olarak 3 gruba ayrıldı. Antibiyotik profilaksisi almayan 23 hastanın 6'sında (%26.08) üriner enfeksiyon saptandı. Ofloksasin profilaksisi alan 42 hastanın 2'sinde (%4.76), trimetoprim-sulfametoksazol profilaksisi alan 45 hastanın 3'ünde (%6.66) üriner enfeksiyon saptandı. Profilaktik antibiyotik rejimi alan her iki grupta da üriner enfeksiyon oranında azalma olmasına rağmen, gruplardaki hasta sayılarının az olması sebebiyle istatistiksel anlamlılık gösterilememiştir (p>0.05, p>0.05).

Çalışmamız transrektal prostat iğne biyopsisinde profilaktik antibiyotik uygulamasının enfeksiyon gelişimini azalttığını göstermektedir. Her ne kadar seçilecek antibiyotik rejimi klinik deneyime bağlı olsa da, transrektal prostat iğne biyopsisinde profilaktik amaçla tek doz fluoroquinolone ya da tek doz trimethoprim-sulfamethoxazole kullanımı effektif, pratik ve ekonomik bir yaklaşım olarak görülmektedir.

Anahtar Kelimeler: Transrektal prostat biyopsisi, Antibiyotik profilaksisi, Ofloxacin, Trimethoprim-Sulfamethoxazole, Enfeksiyon

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Yazışma Adresi: Dr.Kenan İSEN
Kenedy Cad. No:34/6
Kavaklıdere, ANKARA

Transrectal biopsy of prostate could be performed with or without transrectal ultrasonograpy (TRUS) for the histopathological diagnosis of prostate cancer in patients with elevated serum prostate specific antigen levels or an abnormal dig-

ital rectal examination. However, because of the more reliable and easy application, TRUS with multiple transrectal core biopsies of prostate has become a standart procedure in the diagnosis of prostate cancer (1).

Infection is the well-known complication of this procedure. To reduce the infectious complications, various antibiotic regimens have been challenged up to date (2-4). Gram-negative organisms especially E. coli species are the main infectious pathogens which cause urinary infections after prostate biopsies. Ofloxacin and trimethoprim - sulfamethoxazole are effective antimicrobial agents against most of these organisms (5). However, there is still a need to optimize the prophylaxis against infectious complications after biopsies of the prostate.

The aim of this study was to evaluate the need of antibiotic prophylaxis for biopsy of prostate and to compare single dose oral regimens, ofloxacin versus trimethoprim-sulfamethoxazole.

Patients and Methods

From February 1996 to June 1997, 110 patients who underwent TRUS and transrectal core biopsies of prostate were enrolled in the study. Patients were randomly divided into 3 groups. Twenty- three of them (mean age 64.4 years) had not received any antibiotic prophylaxis, 42 of them (mean age 67.1 years) received 400 mg ofloxacin single dose orally and 45 of them (mean age 65.3 years) received 160 mg trimethoprim plus 800 mg sulfamethoxazole single dose orally.

All patients have been provided a sample for urine culture prior to examination. The prophylaxis was started and patients had a fleet enema one hour before biopsy. Exclusion criterias were artificial heart valve, indwelling catheter, diabetes, steroid medication, prostatitis or received any antibiotics in last 3 days. TRUS was performed with the patients in the left decubital position, using a B&K model 3535 scanner with a model 8551 bi-planar probe attached (B&K medical As, Glostrup, Denmark). Six systematic biopsies were taken during longitudinal scaning through an oblique biopsy channel in the transducer, using an 18 G (1.2 mm diameter) biopsy needle and a biopsy gun. If there were a suspicion about some hypoechoic areas, additional biopsies were performed. Return visits were scheduled after 7-10 days with a new urine culture. The patients answered a questionaire if they had experienced any side effects.

Differences between the groups was assessed using the Fisher's Exact test.

Results

Fifty-two patients were diagnosed as cancer and 58 patients had benign conditions on histopathological examination. All of the patients had negative urine cultures before biopsy and positive urine cultures were found 11 of 110 patients after biopsies. Of the 23 patients who had not received any antibiotic prophylaxis, positive urine cultures were found 6 (26.08%). Identified organisms were E. coli in 3 patients, E. faecalis in 2 patients and Klebsiella species in one patient. One patient who suffered acute pyelonephritis and 2 patients who suffered acute prostatitis, required hospitalization. On the other hand, of the 42 patients who received ofloxacin, positive urine cultures were found in 2 (4.76%). Identified organisms were E. coli in one patient, Staphylococcus coagulase (-) in one patient. Of the 45 patients who received trimethoprim - sulfamethoxazole positive urine cultures were found in 3 (6.66%). Identified organisms were E.coli in 2 patients, E. faecalis in one patient. No patient required hospitalization in both antibiotic receiving groups.

There was a reduction in urinary infection in groups which received antibiotic regimens, however, it was not a statisticially significant reduction in urinary infection ($p>0.05$, $p>0.05$). In addition, there was no statistically significant difference between ofloxacin and trimethoprim - sulphamethoxazole groups ($p>0.05$).

Other than infectious complications, 91 patients reported irritative voiding symptoms lasting within 3 days. Sixteen patients suffered transient haematuria/haemospermia, 7 patients had transient bleeding from rectum and 3 experienced urinary retention. No adverse effects were observed from the antibiotic regimens.

Discussion

Prostate cancer represent a significant health problem and early detection can best be achieved

through transrectal ultrasound guided biopsies of the prostate with the suspicion of digital rectal examination or elevated serum prostate specific antigen levels (1). However, transrectal biopsies bring up some complications. Other than transient haematuria and rectal bleeding, urinary infection is another important complication of this procedure. Early studies report low complication rates related with the procedure (6,7), so the value of prophylactic antimicrobials is somewhat controversial and the literature is conflicting. A few placebo controlled study suggest that antimicrobials may decrease the incidence of post - biopsy urinary infection (8,9), but there is not still a concensus against the prophylactic use of antibiotic regimens. On the other hand, there is also a difference of opinion about the dose, duration and type of the antimicrobial. Among the different protocols, recently single dose prophylactic antibiotic regimens were recommended by some investigators suggesting to have similar prophylactic effects with the long term use and to have low cost rates (10-13). Ahlgren et al. (14) compared the fluoroquinolone (norfloxacin 400 mg) twice daily for one day to twice daily for a week and they found no difference between two groups (7.5% versus 5.8%) in the patients who had not any risk factors (a former history of urinary infection, an indwelling catheter or diabetes). In contrast, Aus et al. (15) reported the infection rate as 0.8% in patients who received 400 mg norfloxacin twice daily for one week and 5.6 % in patients who received 400 mg norfloxacin twice daily for one day. The only risk factor identified for post-biopsy infection was steroid medication. Fong et al.(10) compared a single dose of trimethoprim-sulfamethoxazole to netilmycine-metronidazole in 101 men undergoing transrectal biopsy of prostate. They found that the urinary infection rate was greater in netilmycin-metronidazole received group (17%) versus in the trimethoprim-sulfamethoxazole received group (2%). In the study of Atakiler et al. (11) urinary infection rate was 8.7% in patients who received single dose oral fluoroquinolone (500 mg ciprofloxacin) and 23.5% in control group.

In the present study, we observed urinary infection in 26% of patients who did not receive prophylactic antimicrobial therapy, 4.76% of patients who received single dose fluoroquinolone (ofloxacin) and 6.66% of patients who received single dose trimethopim-sulfamethoxazole. Although the difference in infection rates in two groups was insignificant ($p>0.05$, $p>0.05$), this result may be due to the low numbers of patients in each groups. In addition, there was no statistically significant difference between both antibiotic regimens ($p>0.05$). We found positive urine cultures in 11 (10%) patients (6 E. coli, 3 E. faecalis, one Staphylococcus coagulase (-), one Klebsiella species) and 3 (2.7%) of them who did not receive any prophylactic antibiotic regimen admitted to the hospital due to acute pyelonephritis or acute prostatitis. The hospitalization rates in the reviewed literature vary from 0.7% to 9.5% (16,17).

In addition, except urinary infection, most of the patients suffered from various adverse effects of transrectal biopsy of prostate; 91 (82.7%) irritative voiding symptoms, 16 (14.5%) transient haematuria/haemospermia, 7 (6.3%) transient rectal bleeding, 3 (2.7%) urinary retention. These adverse effects disappeared within 3 days, and no medical measures were needed with the exception of catheterization of the patients who have had urinary retention. Haematuria, haemospermia, rectal bleeding and urinary retention were reported as 13-58.4%, 5.7-46%, 2.3-37.1%, and 0.4-2.4% respectively, in the reviewed literature (2,3,15,18-20). Our study also revealed similar findings related with these adverse effects reported in the literature.

As a conclusion, the use of prophylactic antibiotic causes low rate of clinical post-biopsy infections. Although we couldn't show a statistically significance, it was thought to be because of the low number of patients in each group. It would be better to investigate in larger groups. The selection of antibiotic regimen, the use of single dose of oral fluoroquinolone (ofloxacin) or single dose of oral trimethoprim-sulfamethoxazole in patients with no additional risk factors, appears to be a good alternative resulting decreased urinary infection rates. With these prophylactic regimens, there were no significant difference in outcome between the two groups and either of the clinical use of these medications, for the prevention of the infectious complications, seems to be simple, effective and practical.

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