

Antibiotic Prophylaxis and Needle Biopsy

Introduction

Intensive screening for prostate cancer has led to a phenomenal increase in the number of biopsies done. To determine incidence of febrile reactions and to identify the most effective prophylaxis against fever after prostatic cancer biopsy, we reviewed the medical records of patients who had transrectal prostatic needle biopsy.

Method

We reviewed 172 consecutive records of patients who had transrectal prostatic needle biopsy during a three-month period in a health maintenance organization. We recorded the prophylactic regimens and incidence of febrile reaction, defined as temperature $>101^{\circ}$ F accompanied by shaking chills, with or without urinary infection symptoms.

Results

Patients had transrectal prostatic needle biopsy because of a clinical suspicion of prostate cancer or because of elevated serum levels of prostate-specific antigen. Procedures were done in the clinic without anesthesia or sedation and used an 18-gauge spring-loaded needle (Microvasive®, Boston Scientific Corporation, Watertown, Mass). Bowel preparation consisted of a phosphate enema given on the morning before biopsy. Some patients received an additional enema the night before biopsy.

The number of digitally directed and ultrasound-guided procedures were nearly equally distributed. A mean of three to four biopsies were taken (range, one to eight).

Prophylaxis

As preparation for biopsy, group A (102 patients) did not receive ciprofloxacin. Fourteen of these patients received a povidone-iodine enema, intramuscular administration of gentamicin, and oral administration of either trimethoprim (TMP) or trimethoprim-sulfamethoxazole (TMP-SMX) in single doses perioperatively. In 88 patients, the povidone-iodine enema was omitted. These patients received gentamicin alone preoperatively or gentamicin and either TMP or TMP-SMX in single doses. A small number of patients continued to receive TMP-SMX for three to five days.

In group B (45 patients), ciprofloxacin was added to the prophylactic regimen, postoperatively. Of these patients, 28 were given gentamicin preoperatively and ciprofloxacin, 500 mg every 12 hours for three days postoperatively. Seventeen patients received gentamicin, TMP, and metronidazole in single doses perioperatively and ciprofloxacin, 500 mg every 12 hours for two days postoperatively.

Group C (25 patients) started ciprofloxacin prophylaxis preoperatively. Ciprofloxacin, 500 mg, was given every 12 hours for three or four doses, starting the night before the biopsy. No other antibiotics were given.

Fever

Febrile reactions developed in 13 (7.6%) of the patients,¹ usually within one to three days after biopsy (Table 1). There was no correlation of fever with number of biopsy cores. Fever developed in 11 (10.8%) of the group A patients and in two (4.5%) of the group B patients. Fever was not seen in group C patients, who started ciprofloxacin prophylaxis prior to biopsy.

Discussion

Urosepsis—usually caused by *E. coli*—is the most feared complication of transrectal needle biopsy of the prostate. Fever may be expected to develop in about 23% of patients who do not receive prophylactic antibiotics (range, 6% to 48%).^{1,2} Febrile reactions as low as 1.4% to 2.9% have been reported in patients who receive ultrasound-guided biopsy without the benefit of antibiotics.^{3,4} Nonetheless, most centers would recommend prophylactic antibiotics.⁵ Introduction of nonquinolone antibiotics can lower the frequency of febrile reactions to about 12% (range, 0 to 24%).^{6,7} Prophylaxis using quinolones can reduce febrile complications to about 3.2% (range, 0-3.9%).^{8,9,10} Ciprofloxacin diffuses readily into the prostate. After initially high serum levels, orally administered ciprofloxacin concentrates in the prostate during a 12- to 24-hour period.¹¹ Maximal protection against febrile reactions can be realized when quinolone prophylaxis is begun one to 12 hours before transrectal biopsy is done.^{8,9} Although pretreatment with antibiotics is largely responsible for the reduced complication rate, coverage must be continued for 12 hours to seven days after biopsy.^{9,12} The value of ciprofloxacin prophylaxis was underscored by a recent report of 4439 biopsies. Of patients treated with 500 mg ciprofloxacin twice daily for eight doses (beginning with three doses before biopsy), febrile *E. coli* infections developed in 0.07%.¹³ Povidone-iodine solution administered rectally can reduce infectious complications,^{7,14,15} but its use was discontinued in our clinic after vasovagal reactions developed in some patients. Although our findings were not statistically significant, they support use of quinolones to prevent fever due to transrectal prostatic needle biopsy. Compared with other prophylactic regimens, ciprofloxacin prophylaxis substantially lowered the incidence of fever, especially when started preoperatively. Our current protocol calls for ciprofloxacin prophylaxis (500 mg every 12 hours for four doses) starting on the night before biopsy and

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**Table 1. Results of antibiotic prophylaxis in 172 patients receiving transrectal needle biopsy of prostate**

	No. patients	No. (%) febrile reactions
Group A (no ciprofloxacin)	102	11 (10.8)
povidone-iodine enema		
• gentamicin, TMP (or TMP-SMX)	14	1 (7.1)
no povidone-iodine enema	88	10 (11.4)
• gentamicin	11	3 (27.0)
• gentamicin, TMP (or TMP-SMX)	77	7 (9.0)
Group B (ciprofloxacin added postoperatively)	45	2 (4.5)
• gentamicin	28	1 (3.6)
• gentamicin, TMP, metronidazole	17	1 (5.9)
Group C (ciprofloxacin only; started preoperatively)	25	0 (0.0)
Total	172	13 (7.6)

TMP = trimethoprim; TMP-SMX = trimethoprim-sulfamethoxazole

self-administration of phosphate enema on the morning of biopsy. Patients are encouraged to minimize consumption of liquids to maximize the concentration of antimicrobial agent in tissue and urine. This regimen has reduced the incidence of fever to <2%.

Conclusion

Ciprofloxacin given before and after transrectal prostatic needle biopsy may prevent febrile complications. Physicians who have not yet done so might consider a similar cost-effective policy. ❖

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“Ciprofloxacin given before and after transrectal prostatic needle biopsy effectively prevents febrile complications. Those physicians who have not yet done so, are encouraged to adopt a similar cost-effective protocol.”