The clinical importance of antibiotic regimen in prostate biopsy: a single center analysis of more than 10,000 cases

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INTRODUCTION

- This study aims to evaluate the effectiveness of an antibiotic regimen for prostate biopsy by analyzing patients who were hospitalized due to complications after transrectal ultrasound-guided prostate biopsy

METHODS

We retrospectively reviewed the medical records of 10,339 patients who underwent transrectal ultrasound-guided prostate biopsy at our institution from May 2003 to April 2017.

All patients underwent urine culture before transrectal ultrasound-guided prostate biopsy and received IV antibiotics 30-60 minutes before biopsy. Patients were either given prophylactic quinolone or prophylactic second or third generation cephalosporin.

Clinicopathologic factors including patient age, antibiotic regimen, number of biopsy cores, body mass index, prostate specific antigen, prostate volume, and infection-related complications that required hospitalization were subsequently analyzed.

CONCLUSION

A total of 9,487 patients were included in the final analysis, of which 33 patients (0.35%) were hospitalized due to infection-related complications.

Infection-related hospitalization rates were significantly lower in patients who received cephalosporin (0.2%) than in patients who received quinolone (1.64%).

At our institution, cephalosporin has been predominantly used to prevent post-biopsy infections since January 2013.

Only five patients (0.12%) developed post-operative complications out of the 3,863 patient who underwent transrectal ultrasound-guided prostate biopsy.

RESULTS

Table 1. Comparison of clinicopathological features among men who received contemporary multicore prostate biopsy

Variable	Entire cohort	Quinolone	Cephalosporin	P value
Number of patients	9,487	1,007	8,480	
Mean age (years)	64.9 ± 9.3	65.0 ± 9.4	64.9 ± 9.3	0.777
Mean BMI (kg/m^2)	24.4 ± 2.7	24.21 ± 2.76	24.39 ± 2.73	0.051
Diabetes mellitus (%)	14.5% (1,373/9,487)	14.8% (149/1,007)	14.4% (1,224/8,480)	0.740
Median PSA (ng/mL)(IQR)	6.6 (4.3-10.5)	6.2 (4.3-9.8)	6.6 (4.3-10.6)	0.321
Mean Prostate volume (mL)	44.5 ± 21.3	49.08 ± 25.32	43.92 ± 20.76	<0.001
IPSS (%)				0.086
Mild	33.4% (3,169/9,487)	30.7% (309/1,007)	33.8% (2,863/8,480)	
Moderate	48.3% (4,582/9487)	48.8% (491/1,007)	48.3% (4,093/8,480)	
Severe	18.3% (1,736/9,487)	20.6% (207/1,007)	18.0% (1,524/8,480)	
Number of biopsy taken (%)				<0.001
Initial	8,373 (88.3)	955 (94.8%)	7,418 (87.5%)	
Repeat	1,114 (11.7)	52 (5.2%)	1,062 (12.5%)	
Number of biopsy cores (%)				<0.001
≤ 12	71.5% (6,785/9,487)	57.1% (5,75/1,007)	73.2% (6,210/8,480)	
≥ 13	28.5% (2,702/9,487)	42.9% (4,32/1,007)	26.8% (2,270/8,480)	
Number of biopsy cores	12.5 ± 1.0	13.0 ± 1.7	12.5 ± 0.9	<0.001
Pathologic diagnosis after biopsy (%)				<0.001
Carcinoma	3,263 (34.4%)	302 (29.9%)	2962 (34.9%)	
Prostatitis	528 (5.6%)	141 (14.0%)	387 (4.6%)	
Benign prostatic hyperplasia	5696 (60.0%)	565 (56.1%)	5131 (60.5%)	

Table 2. Univariate and multivariate analyses of infection-related hospitalization after prostate biopsy

Variable	Univariate		Multivariate	
	OR (95% CI)	p value	OR (95% CI)	p value
Age				
< 70	1.000			
≥ 70	0.033 (0.934-0.998)	0.001		
BMI	1.000 (0.883-1.134)	0.995		
Diabetes mellitus	0.590 (0.180-1.936)	0.384		
Prostate volume	1.000 (0.984-1.016)	0.961		
IPSS				
Mild	1.000			
Moderate	0.767 (0.311-1.891)	0.565		
Severe	2.040 (0.827-5.032)	0.122		
Number of biopsy taken				
Initial	1.000			
Repeat	0.485 (0.116-2.027)	0.321		
Number of biopsy cores taken				
≤ 12	1.000			
≥ 13	1.855 (0.929-3.704)	0.080		
Antibiotic prophylaxis				
Quinolone	1.000		1.000	
2nd Cephalosporin	0.032 (0.004-0.238)	0.001	0.121 (0.016-0.937)	0.043
3rd Cephalosporin	0.153 (0.076-0.306)	<0.001	0.133 (0.061-0.289)	<0.001

Table 3. Clinical features of patients hospitalized due to complications due to bacterial infection after prostate biopsy

	Quinolone	2$_{nd}$ or 3$_{rd}$ cephalosporin
Number of patients (%)	16	17
Isolation bacteria (%)	68.75 (11/16)	41.17 (7/17)
E.coli	10/11	1/7
Enterococcus	1/11	4/7
CNS	0/11	1/7
K.penumoniae	0/11	1/7
Septic shock (%)	18.75 (3/16)	0
Mortality (%)	6.25 (1/16)	0