

ANTIMICROBIAL PROPHYLAXIS BEFORE URODYNAMIC STUDY: SINGLE INSTITUTION EXPERIENCE IN A FACE OF AUA/SUFU BEST PRACTICE STATEMENT ON URODYNAMIC ANTIMICROBIAL PROPHYLAXIS

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ABSTRACT

INTRODUCTION AND OBJECTIVES

Urodynamic study (UDS) is an invasive ambulatory procedure that carries a risk for urinary tract infection (UTI). SUFU has published the Best practice policy statement on urodynamic antibiotic prophylaxis in the non-index patient. The statement justifies antimicrobial prophylaxis before UDS in patients with certain risk factors. However, most of the recommendations for antibiotic prophylaxis have low level of evidence. The aim of the study was to verify a symptomatic post-UDS UTI rate following local protocol of antibiotic prophylaxis and identify possible risk factors for post-UDS symptomatic UTI.

METHODS

680 patients in an IRB-approved retrospective review of UDS clinic electronic charts' database. Anyone with symptoms of: dysuria, urinary frequency, urgency or fever and a positive urine culture within 7 days after UDS considered as post-UDS symptomatic UTI. Following variables: age >70, male gender, past or current smoking, diabetes mellitus, neuropathic pathologies, indwelling or intermittent catheters, time interval between urine culture (UC) and a day of UDS, presence of asymptomatic bacteriuria pre-UDS were verified as possible risk factors for post-UDS UTI.

RESULTS

Mean age of a study population was 64.2 (range=19-95) years old. 408/680(60%) were male. 544(80%) patients had a negative UC prior to UDS with similar symptomatic UTI rate [9(1.7%) vs 2(1.5%)] among patients who had prior to UDS appropriately treated positive UC (p=1.0). There was no significant difference in a time interval between UC and a date of UDS in a group that developed UTI compared to an asymptomatic group (p=0.48). In both, univariate and multivariate analysis, age >70, time interval between UC and UDS more than a week, male gender, diabetes mellitus and neuropathic conditions were found as non-significant variables predicting post-UDS symptomatic.

CONCLUSIONS

The first study to verify a symptomatic post-UDS UTI rate and identify possible risk factors for post-UDS symptomatic UTI. This study supports our antimicrobial prophylaxis protocol before UDS to minimize post-UDS UTI rate. However, a retrospective design and a relatively small number of patients in each group of proposed risk factors might be a cause that no significance found in univariate and multivariate analyses.

INTRODUCTION

- Urodynamic study (UDS) is an invasive ambulatory procedure that carries a risk for urinary tract infection (UTI).
- SUFU/AUA has published the **Best Practice Policy Statement on urodynamic antibiotic prophylaxis in the non-index patient**. The statement justifies antimicrobial prophylaxis before UDS in patients with certain risk factors. However, most of the recommendations for antibiotic prophylaxis have low level of evidence.
- **EUA guidelines justify antibiotics** in a case of: bacteriuria, indwelling catheters, neurogenic lower urinary tract dysfunction and a history of UTI.
- SUFU+EAU based mostly on studies that used a rate of all types of bacteriuria as a measure of post-procedure UTI.
- Studies verifying an **actual rate of symptomatic UTIs** and identifying **risk factors for post-UDS symptomatic UTI** are lacking.

OBJECTIVES

- to verify a symptomatic post-UDS UTI rate following local protocol of antibiotic prophylaxis
- to identify possible risk factors for post-UDS symptomatic UTI.

MATERIALS AND METHODS 1

- 680 patients in an IRB-approved retrospective review of UDS clinic electronic charts' database.
- **Definition of UTI post-UDS:**
 - referral to a family practitioner within 2 weeks,
 - symptoms of: dysuria, urinary frequency, urgency or fever,
 - a positive urine culture up to 7 days after UDS.

MATERIALS AND METHODS 2

•UDS Clinic routines:

- negative urine culture = no antimicrobial treatment before UDS.
- asymptomatic positive urine culture = 3 day appropriate treatment before UDS.

•Proposed risk factors for post-UDS UTI:

- age >70,
- male,
- past or current smoking,
- diabetes mellitus,
- neuropathic pathologies,
- indwelling or intermittent catheters,
- time interval between urine culture and the day of UDS,
- presence of asymptomatic bacteriuria pre-UDS.

RESULTS

Table 1: Demographics and Proposed Risk Factors for Post-UDS UTI

	Pre-UDS Negative Culture	Pre-UDS Positive Culture	p
No. of patients (%):	544 (100)	136 (100)	
Male (%)	346 (63.6)	62 (45.6)	0.0001
Female (%)	198 (36.4)	74 (54.4)	
Age (mean ± std years):	63.2±15.2	68.0±12.0	0.0007
Male	64.0±14.9	71.1±11.4	0.0004
Female	62.0±15.8	65.3±12.0	0.1
Proposed risk factors (no. of patients):			
Past/current smoking	191 (35.1)	39 (28.7)	0.0062
Hypertension	220 (40.4)	60 (44.1)	0.607
Diabetes Mellitus	123 (22.6)	42 (30.9)	0.0441
Neuropathic pathologies*	168 (30.9)	52 (38.2)	0.1011
Indwelling Catheter/CIC	32 (5.9)	19 (13.9)	0.011
Mean time between urine culture and UDS (days ± std):	21.7±31.8	19.7±22.3	0.4892

Table 2. Positive Urine Culture Pathogens before UDS

	Pre-UDS Positive Culture
Pre-UDS urine culture pathogens (no. of patients (%)):	
Gram Negative Pathogens	83 (61.0)
Enterococci	5 (3.7)
Mixed Flora	45 (33.1)
Staph Aureus+ Strep Group B	3 (2.2)

RESULTS 2

Table 5. Univariate and Multivariate Analysis of proposed Risk Factors for Post-UDS UTI

	OR	95% CI	p
Univariate analysis:			
Male gender	0.5500	0.1662-1.8205	0.3268
Age ≥70 years	3.7738	0.9923-14.3520	0.037
Past/current smoking	0.1921	0.0244-1.5103	0.0521
Hypertension	1.1939	0.3608-3.9513	0.7723
Diabetes Mellitus	1.1736	0.3077-4.4761	0.82
Neuropathic pathologies*	1.7597	0.5311-5.8300	0.362
Indwelling Catheter/CIC	1.1623	0.1460-9.2544	0.8892
Pre-UDS positive urine culture	1.4972	0.3919-5.7200	0.5673
Time interval ≥10 days between urine culture and UDS	0.6158	0.1786- 2.1233	0.4349
PVR≥150ml	3.3443	0.4614-24.2400	0.2449
Multivariate analysis:			
Male gender			0.4925
Age ≥70 years			0.0507
Past/current smoking			0.1621
Hypertension			0.8937
Diabetes Mellitus			0.9733
Neuropathic pathologies*			0.3727
Indwelling Catheter/CIC			0.9207
Pre-UDS positive urine culture			0.8671
Time interval ≥10 days between urine culture and UDS			0.6164

Table 3. Post-UDS Urine Culture Pathogens for Suspected UTI

Post-UDS urine culture with symptoms (no. of patients):	20	9	0.1521
E. Coli	1	0	
Klebsiella	2	0	
Morganella	0	1	
Mixed Flora	5	1	
Proteus	1	0	
Negative	11	7	

Table 4. Relationship between UDS and Urine Culture for Suspected UTI

	Pre-UDS Negative Culture	Pre-UDS Positive Culture	p
Mean time between UDS and urine culture for suspected UTI (mean days ± std):			
Total	4.0±1.9	4.9±1.8	0.2412
Any positive culture	4.2±2.0	5.5±0.7	0.4042
Negative culture	3.8±1.9	4.7±2.1	0.3605

CONCLUSIONS

- **The first study to verify a symptomatic post-UDS UTI rate and identify possible risk factors for post-UDS symptomatic UTI.**
- **There were similar and low rates of post-UDS UTI in both study groups.**
- **This study supports our antimicrobial prophylaxis protocol before UDS to minimize post-UDS UTI rate.**
- **However, a retrospective design and a relatively small number of patients in each group of proposed risk factors might be a cause that no significance found in univariate and multivariate analyses.**