Improving Antibiotic Prophylaxis Selection for Patients Undergoing Urology Procedures

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Background

- Evidence evaluating prescribing patterns in antibiotic (ABC) prophylaxis (PPX) for urology (UGY) procedures is limited.
- Although national guidelines provide ABC PPX recommendations for specific procedures, they should also be based on local ABC resistance patterns, individual host factors and risks related to specific procedures.
- Our institution's urine culture antibiogram illustrates increasing resistance to Cefazolin, a national guideline preferred ABC.
- The purpose of this study is to assess the impact of a quality improvement intervention on prescribing practices for ABC PPX in patients undergoing UGY procedures.

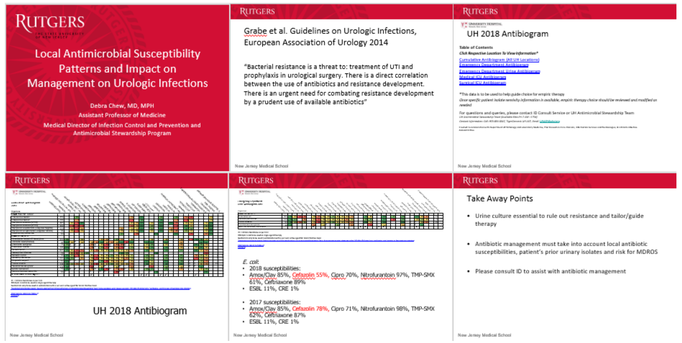
Research Objectives

- Compare the appropriateness of antimicrobial selection for surgical prophylaxis (based on local susceptibility patterns, host factors and procedure performed) in the preintervention period versus the postintervention period
- Compare the perioperative antimicrobial dose and timing of administration prior to urologic procedure in the preintervention and postintervention groups
- Compare the perioperative and postoperative use of antimicrobials in the preintervention and postintervention groups
- Compare the incidence of postoperative infectious complications (including surgical site infections) between the preintervention and postintervention groups

Methods

- This is a retrospective study evaluating all patients receiving perioperative ABC PPX for UGY procedures from 01/01/2019 to 07/31/2019 at University Hospital.
- The intervention (focusing on UGY provider education for ABC PPX based on local ABC resistance patterns, host factors and UGY procedure type) occurred on multiple in-person sessions during 04/2019.
- Emphasis occurred with replacing Cefazolin with Ceftriaxone, given local resistance patterns.
- We compared patient characteristics, appropriate ABC PPX use (deemed by local ABC Stewardship Team) and postoperative infections between the "pre" (01/01/2019 – 03/31/2019) and "post" (05/01/2019 –07/31/2019) groups.

Intervention: Provider Education (Select Content)



Patient Characteristics

Patient Characteristics (n=165)	Intervention Period	
	Pre-intervention (n=85)	Post-intervention (n=80)
Male	57	56
Hispanic/Latino	22	36
Hypertension	42	43
Current tobacco user	14	13
Diabetes mellitus	16	18
Chronic kidney disease	14	14
Congestive heart failure	2	3
Insurance Status: Charity Care	21	23
Insurance Status: Medicare/Medicaid	39	27

Classification of Procedure	Intervention Period	
	Pre-intervention (n=85)	Post-intervention (n=80)
Clean	10	16
Clean-contaminated	74	61
Contaminated	1	2
Dirty	0	1
ASA Physical Status Classification		
ASA I	18	6
ASA II	48	41
ASA III	19	33

Patient Characteristics (n=165)	Intervention Period	
	Pre-intervention (n=85)	Post-intervention (n=80)
Urine culture taken before intervention	31	35
Clean catch urine culture collection	29	34
Urine culture shows bacterial growth	14	30
History of MDRO Infection	7	5

Results*

*Descriptive statistics were utilized to describe our study results

ABC PPX Used	Intervention Period		p
	Pre-intervention n=85	Post-intervention n=80	
Cefazolin	49	13	< 0.001
Ceftriaxone	13	51	< 0.001
Cefepime	1	0	NS
Cefoxitin	1	1	NS
Ceftazidime	0	1	NS
Ciprofloxacin	1	0	NS
Clindamycin	3	2	NS
Ertapenem	0	1	NS
Fluconazole	2	0	NS
Gentamicin	4	3	NS
Levofloxacin	2	1	NS
Meropenem	5	3	NS
Metronidazole	0	1	NS
Vancomycin	2	1	NS
Piperacillin/ Tazobactam	2	2	NS

NS = Not Statistically Significant

Timing of ABC Administration Prior to Procedure	Intervention Period		p
	Pre-intervention n=85	Post-intervention n=80	
1 - 2 hrs	3	4	0.25
30 mins - 1 hr	1	4	
< 30 mins	65	65	
> 2 hrs	10	4	
Initial Dose During Procedure	6	3	

Selected Outcomes	Intervention Period		p
	Pre-intervention n=85 (%)	Post-intervention n=80 (%)	
Appropriate ABC PPX Based on UH Antibiogram	10 (14.5%)	125 (76%)	< 0.001
Use of Postprocedural ABCs	34 (40%)	28 (35%)	0.5
Appropriate Postprocedural ABC Use**	11 (13%)	13 (16%)	0.5
Development of Postoperative Infection	6 (7%)	9 (11.2%)	0.4

**Based on local guidelines

Discussion

- After the intervention, appropriate ABC PPX choice improved (14.5% to 76%, P < 0.001) based on local ABC resistance patterns.
- No significant difference was noted in urine culture collection before procedure, use of ABC PPX post-procedure, and postoperative infections.
- Areas for improvement include: administering ABC PPX within 2 hours before surgical incision, reducing inappropriate post-procedural ABC use, and obtaining urine cultures prior to UGY procedure.

Limitations

- Our study was small with a limited time-frame for follow-up.
- As this was a retrospective study, data was not collected in a standardized manner and may have been subject to potential biases.

Conclusion

- Utilization of education sessions as a quality improvement intervention resulted in significant improvement in ABC PPX choice for UGY procedures based on local ABC resistance patterns.
- Further interventions are necessary to optimize additional areas related to ABC PPX use for UGY procedures.

References

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