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**Are Culture-Directed Antibiotics Superior in Preventing Complications of Prostate Biopsy: a Comprehensive Look at Over 60,000 Prostate Biopsies in Michigan**

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**INTRODUCTION AND OBJECTIVE:** Previous research using the Michigan Urological Surgery Improvement Collaborative (MUSIC) database has shown superiority of culture-directed antibiotics (CDA) or multiple antimicrobial agents (MAA) over single agent prophylaxis during transrectal (TR) prostate biopsy (PB). It remains undetermined which antimicrobial pathway and PB technique, TR vs transperineal (TP), are associated with the lowest complication rates.

**METHODS:** All PB performed at a MUSIC practice from March 2012 to November 2020 were included. Data were collected by trained abstractors in practices representing ~95% of urologists in Michigan. We compared rates of complications among patients who underwent CDA with TR PB, MAA with TR PB, and no antimicrobial pathway with TP PB. Data was further compared between practices with routine use (>75%) or selective use (4% to 75%) of a CDA pathway.

**RESULTS:** Among 69,016 PB, 8.7% were performed with CDA and 83.8% with MAA. Overall rates of infectious complication (1.5%) and infectious hospitalization (0.6-0.7%) were not significantly different between patients undergoing TR PB with MAA compared to TR PB with CDA. There was no difference in rates of infectious complication and infectious hospitalization between practices that regularly vs. selectively used CDA. Among practices that selectively used CDA, rates of infectious hospitalization were significantly lower (p=0.046) with CDA (0.4%) compared to MAA (0.8%). Rates of infectious complication were significantly lower with TP PB (n=1209, 1.8% of PB) compared to both CDA and MAA pathway transrectal PB (0.3% vs 1.5%) but there was no significant difference in infectious hospitalization rates.

**CONCLUSIONS:** Utilization of rectal swabs to permit CDA with PB has been sparse across MUSIC practices. Our evidence indicates that both CDA and MAA are safe, with lower infectious hospitalization rates in the patients that selectively received CDA. TP PB appears to be a good alternative that can be performed with comparable overall complication rates to TR PB, and without antibiotics.

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Antibiotic Pathway	30-Day ER visit		p	30-Day hospitalization		p
	No	Yes		No	Yes	
No. patients	60093	904		60456	541	
TR w/ CDA	5043 (98.2%)	92 (1.8%)	0.133	5087 (99.1%)	48 (0.9%)	0.334
TR w/ MAA	54304 (98.5%)	803 (1.5%)		54617 (99.1%)	490 (0.9%)	
TP w/o pathway	746 (98.8%)	9 (1.2%)		752 (99.6%)	3 (0.4%)	
	Infectious hospitalization		p	Infectious complication		p
	No	Yes		No	Yes	
No. patients	60582	415		60077	920	
TR w/ CDA	5103 (99.4%)	32 (0.6%)	0.154	5060 (98.5%)	75 (1.5%)	0.017
TR w/ MAA	54725 (99.3%)	382 (0.7%)		54264 (98.5%)	843 (1.5%)	
TP w/o pathway	754 (99.9%)	1 (0.1%)		753 (99.7%)	2 (0.3%)	