Transrectal MRI Fusion Biopsy is Associated with Higher Risk of Infection Compared to Other Biopsy Methods – An Analysis of a Statewide Collaborative

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Sources of Funding: Blue Cross and Blue Shield of Michigan

Abstract no. 20-4217

BACKGROUND

- Infectious complications following prostate biopsy remain a significant cause of morbidity, driven by antibiotic resistance.
- Recently-introduced biopsy techniques, including MRI-fusion and transperineal biopsy, have increasing levels of adoption. The impact of this adoption on infectious complications is unknown.

OBJECTIVE

- To evaluate the effect of biopsy-type on the risk of an infectious complication.

METHODS

- Michigan Urologic Surgery Improvement Collaborative (MUSIC) prospective registry of all patients undergoing prostate biopsy (all methods) from January 2012 through August 2019.
- Biopsy methods included transrectal non-fusion (TR), trans-rectal MR-fusion (TRF), transperineal non-fusion (TP), and transperineal MR-fusion (TPF).
- Patient characteristics, biopsy-type, and 30-day complications were analyzed.
- Multivariable analysis was performed to assess risk factors for infectious complications and hospitalizations.

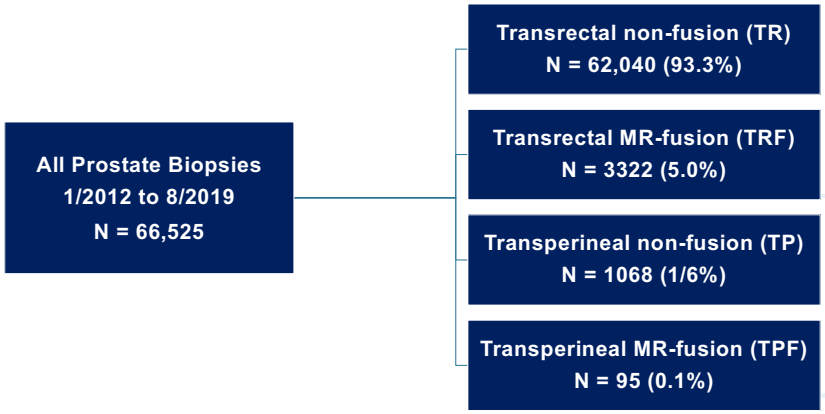

Figure 1: Study flow diagram

RESULTS

Variable	Infectious Complication			Infectious Hospitalization		
	OR	95% CI	p-value	OR	95% CI	p-value
TRF vs TR	1.62	(1.28, 2.06)	<0.01	2.16	(1.56, 2.98)	<0.01
TP vs TR	0.48	(0.24, 0.95)	0.03	0.26	(0.06, 1.06)	0.06
TPF vs TRUS	<0.01	(0.00, 7E161)	0.96	<0.01	(0.00, 2E235)	0.97
African American vs White	1.02	(0.84, 1.23)	0.84	1.24	(0.96, 1.60)	0.10
Other race vs White	1.39	(1.16, 1.66)	<0.01	1.40	(1.08, 1.81)	0.01
Diabetes	1.65	(1.42, 1.93)	<0.01	1.80	(1.44, 2.23)	<0.01
Prior biopsy within past 12 months	0.72	(0.53, 0.97)	0.03	0.60	(0.38, 0.96)	0.03
Biopsy performed after state-wide initiative	0.79	(0.61, 1.03)	0.08	0.58	(0.41, 0.81)	0.00
Age 61-65 v. <60	0.93	(0.78, 1.10)	0.40	0.94	(0.74, 1.20)	0.62
Age 66-70 vs <60	1.00	(0.85, 1.19)	0.98	0.97	(0.76, 1.24)	0.81
Age 70 vs <60	0.93	(0.79, 1.11)	0.42	0.78	(0.60, 1.00)	0.05
Total Cores	1.01	(1.00, 1.02)	0.02	1.01	(0.99, 1.03)	0.54

Table 1. Factors associated with an infectious complication and infection-related hospitalization.

- There were 83 (2.5%) men in the TRF biopsy group with an infectious complication compared to 989 (1.59%) in the TR, 9 (0.84%) in the TP and 0 (0%) in the TPF groups.
- When controlling for patient characteristics, TRF biopsy type was associated with increased odds of an infectious complication (OR 1.62, p<0.001) and infectious hospitalization (OR 2.16, p<0.001) when compared to TR patients.
- Total cores and diabetes were associated with an increased risk of an infectious complication.
- The transperineal approach and biopsies performed after the implementation of a state-wide antibiotic pathway designed to decrease these complications were less likely to result in an infection-related hospitalization

CONCLUSIONS

- Transrectal fusion biopsy was associated with an increased risk of post-biopsy infectious complications and hospitalizations.
- Alternative biopsy techniques, including transperineal fusion biopsy, may mitigate this risk.

ACKNOWLEDGEMENTS

We would like to acknowledge the significant contribution of the MUSIC urologists, administrators and data abstractors in each participating practice. In addition, we would like to acknowledge the support provided by the Value Partnerships program at Blue Cross Blue Shield of Michigan.