MP75-17 - Ethnic Variation in Prostate Cancer Detection: A Hypothesis Generating Study for use of the Stockholm3 Test in an American Cohort

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BACKGROUND

- African American men have been shown to have higher PSA, more likely to have prostate cancer (PC), and more likely to have high grade of cancer at PC diagnosis compared to Caucasian men
- Stockholm3 is a validated model used for PC detection, incorporating: PC-associated protein levels + a germline genetic risk score + prebiopsy clinical information
- It is unknown if Stockholm3 would be useful in an American cohort where clinical practice patterns and ethnicity differ

OBJECTIVES

- To evaluate if the detection of ISUP grade group ≥2 (GG≥2 PC) between Chicago and Stockholm once risk profiles are equivalent
- To perform secondary analysis with Stockholm3 in matched Stockholm men to ethnicity-specific risk profiles from Chicago

METHODS

Design: Retrospective analysis

Setting: Men who underwent prostate biopsies; Age: 50-69 years

Population: STHLM3 cohort from May 2012 to May 2013 (n = 7,417) & Uni of IL Chicago from June 2016 to July 2019 (n = 634)

Outcome: Detection of GG≥2 PC on biopsy

Race/ethnicity: African Am (AA), Caucasian, and Hispanic

METHODS

Propensity scores (PS) were estimated for each man in the study using pre-biopsy covariates including:

- Age
- PSA
- Prostate volume
- Family history of PC
- Prior negative biopsy
- Use of a 5-alpha reductase inhibitor

- Swedish men were matched to ethnic groups risk profiles from Chicago
- Area under the receiver operating curve (AUC) for Stockholm3 and PSA was assessed in matched cohorts

RESULTS

	Chicago				Stockholm
	African American	Caucasian	Hispanic	Overall	STLHM3
	n = 303 (60 %)	n = 62 (12%)	n = 106 (21%)	N = 504	N = 6980
Age (years)*	61.0 *[56.0, 65.0]*	61.0 *[58.0, 65.0]*	62.0 *[58.0, 65.0]*	61.0 *[57.0, 65.0]*	64.0 *[59.0, 67.0]*
PSA (ng/mL)*	7.50 *[5.30, 11.7]*	5.00 *[4.40, 6.98]*	6.45 *[5.05, 10.6]*	6.60 *[5.08, 10.7]*	3.70 *[3.00, 5.20]*
Prostate volume (cc)*	34.0 *[24.4, 53.5]*	36.5 *[27.0, 47.8]*	41.2 *[31.4, 64.2]*	36.0 *[26.0, 55.0]*	40.0 *[30.0, 54.0]*
Family Hx of PCa % (n)	23.4% (71/303)	25.8% (16/62)	19.8% (21/106)	22.0% (111/504)	15.1% (1057/6980)
5-α Reductase Inhib. % (n)	3.0% (9/303)	3.2% (2/62)	8.5% (9/106)	4.4% (22/504)	2.3% (164/6980)
Prior Negative Biopsy % (n)	5.9% (18/303)	8.1% (5/62)	15.1% (16/106)	7.9% (39/504)	6.0% (419/6980)

*Described as Medians [Q1, Q3]

Table 1: Key characteristics of the matched Chicago and Stockholm biopsy cohorts

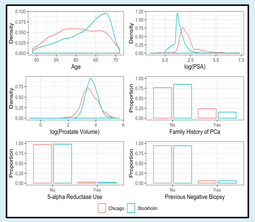

Figure 1: Density plots of covariates prior to propensity score matching for African American men and STHLM3 men

RESULTS

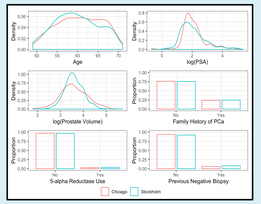

Figure 2: Density plots of covariates after propensity score matching for African American men and STHLM3 men

	Before Propensity Score Matching					After Propensity Score Matching				
	STHLM3		Chicago AA			STHLM3'		Chicago AA'		
	Mean	SD	Mean	SD	SMD	Mean	SD	Mean	SD	SMD
Age (years)	62.8	5.2	60.5	5.5	-0.422	59.8	5.3	60.5	5.4	0.125
PSA (ng/mL)	5.0	8.5	27.0	115.8	0.190	12.9	21.1	12.4	17.2	-0.004
Prostate Volume (cc)	44.7	21.4	42.5	27.1	-0.082	39.9	20.3	43.0	27.3	0.115
Family History of PCa (%)	15.1		23.4		0.083	24.5		23.9		-0.006
5-alpha Reductase Use (%)	2.3		3.0		0.006	3.5		3.1		-0.005
Previous Negative Biopsy (%)	6.0		5.9		-0.001	8.0		6.1		-0.018

Table 2 : Before and after matching between African American and Stockholm subjects

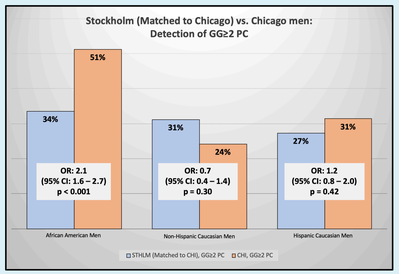

Figure 3: GG≥2 PC detection rates seen in men from different ethnicity groups and risk-matched Swedish men

Detection of GG≥2 PC was far higher in AA Chicago men even after matching: 51% versus 34% (OR: 2.1, 95% CI: 1.57–2.74, *P* <0.001) compared to matched Caucasian and Hispanic cohorts

RESULTS

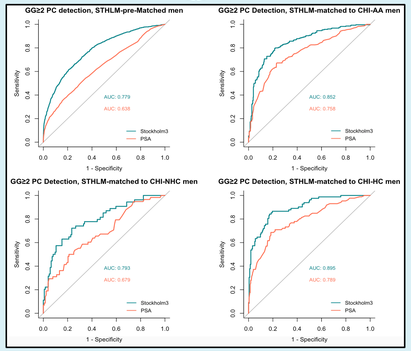

Figure 4: Receiver operating characteristics for GG≥2 PC detection with PSA and Stockholm3 in Swedish men with risk profiles matched to different ethnicity groups

AA (African American), NHC (non-Hispanic Caucasian), HC (Hispanic Caucasian, CHI (Chicago), STHLM (Stockholm)

DISCUSSION

- Genome-wide association studies have shown overlap of risk variants previously identified in European men with African American men
- A prostate risk model using a germline genetic risk has not been assessed in a multiethnic population

CONCLUSION

- There may be additional factors associated with increased detection of PC in African American men even after adjusting for known PC risk factors
- Further studies are needed and underway to assess biologic risk in multiethnic populations

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