Commercial prognostic tests for prostate cancer may not be accurate in African American men

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Commercial gene expression tests that guide treatment decisions for prostate cancer may not accurately predict risk of disease progression in

African American patients, according to results published in *Cancer Epidemiology, Biomarkers, and Prevention*, a journal of the American Association for Cancer Research.

"When a man is diagnosed with low- or intermediate-risk prostate cancer , commercially available tests may be used to measure gene expression in the prostate tumor. This information is used to estimate the likelihood of disease progression and can influence how the patient's cancer is treated," said Travis A. Gerke, ScD, assistant member at Moffitt Cancer Center.

African American men have a 70 percent greater risk of prostate cancer and are more than twice as likely to die from the disease compared to European American men. However, OncotypeDX Prostate, Prolaris, and Decipher—three of the commercial gene expression tests for prostate cancer—were developed and validated in predominantly European American cohorts, explained Gerke.

"Unfortunately, African Americans are underrepresented across many areas of public health research, and prognostic biomarker discovery in prostate cancer is no exception," said Gerke. "Because African American men have a high risk of aggressive prostate cancer, they represent a patient population in critical need of prognostic tools to help with the early stages of treatment decision-making."

In this study, Gerke and colleagues examined whether gene expression patterns differed by race for the genes included in the OncotypeDX Prostate, Prolaris, and Decipher tests. All three of these tests are recommended by the National Comprehensive Cancer Network guidelines to predict outcomes in men with low- or intermediate-risk prostate cancer.

The study used NanoString, a gene expression panel, to compare the

expression of 60 genes included in the commercial tests from tumor samples of 327 patients, which included 95 African American patients and 232 European American patients. The analysis showed that 48 percent of the genes included in the panels were expressed at different levels in African American men than in European American men. This finding was not entirely surprising given known racial differences in disease aggressiveness, explained Gerke.

However, the authors found that the risk predictions provided by Prolaris and Decipher based on the risk scores were not significantly different between African American and European American men. Furthermore, the OncotypeDX scores provided more favorable risk prediction for African American men compared to European American men. These risk predictions were unexpected because, on average, African American men have worse outcomes than European American men, Gerke noted.

"The risk predictions for African American men from these commercial gene tests conflict with the likely clinical outcomes for these patients," said Gerke. "Until the risk prediction accuracy of the tests has been thoroughly studied in African American patients, we urge caution in their use for clinical decision-making. We hope that our report escalates interest in validating the utility of genomic risk predictors in African American men."

One limitation of the study is the lack of follow-up data to compare the outcomes of the patients with the predicted outcomes from this study. Future studies examining long-term disease progression and survival will be necessary for direct evaluation of the accuracy of the tests in predicting prognosis.

Another limitation was that the analysis used a common gene panel called NanoString instead of the commercial panel of each test. While

this allowed for uniform assessment across all three gene expression tests, the deviation from each test's protocol may have impacted the findings.

More information: Jordan H. Creed et al. Commercial Gene Expression Tests for Prostate Cancer Prognosis Provide Paradoxical Estimates of Race-Specific Risk, *Cancer Epidemiology Biomarkers & Prevention* (2019). DOI: 10.1158/1055-9965.EPI-19-0407

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