Genetic tool improves estimation of prostate cancer risk in diverse ethnic/racial groups

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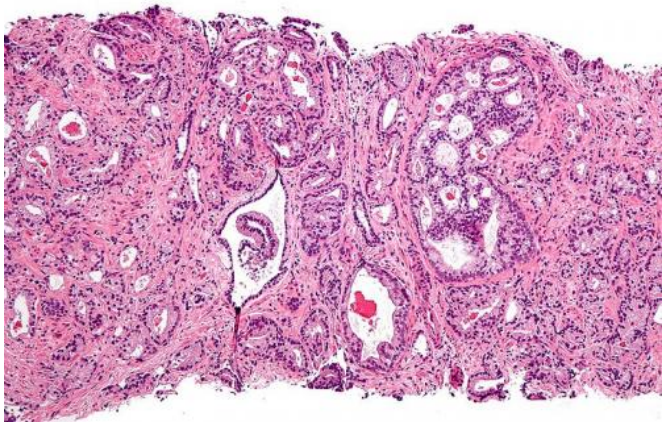

Micrograph showing prostatic acinar adenocarcinoma (the most common form of prostate cancer) Credit: Wikipedia

Building upon previous research, an international team led by scientists at University of California San Diego School of Medicine, has validated a more inclusive and comprehensive genetic tool for predicting age of onset of aggressive prostate cancer, a disease that killed more than 33,000 American men in 2020.

Reporting in the February 23, 2021 online edition of *Nature Communications*, the researchers describe the performance of a polygenic hazard score (PHS)—a mathematical estimate of an individuals' age-specific genetic risk for developing a disease—in a multi-ethnic patient population.

"Genetic tools to predict a man's lifetime risk of prostate cancer might allow us to target cancer screening efforts to the men who are most likely to need it. We are addressing a major public health problem and simultaneously addressing a concern that genomics and genetic tests may exacerbate health disparities because people of non-European ancestry are severely under-represented in most studies," said principal investigator Tyler Seibert, MD, Ph.D., assistant professor at UC San Diego School of Medicine and radiation oncologist at Moores Cancer Center at UC San Diego Health.

The genetic score developed at UC San Diego was tested in a multi-ethnic dataset of 80,491 men and was shown to be associated with age of onset of prostate cancer, as well as with age at death from prostate cancer. The PHS demonstrated excellent performance in men of European, Asian and African genetic ancestry, said the authors.

However, according to Seibert, there was a prominent gap between men of African versus European ancestry. Most likely, he said, because men of African ancestry were not included in the development of the genetic tool.

In a study published in the *International Journal of Cancer* in 2020, Seibert and a team of researchers, including Roshan Karunamuni, Ph.D., assistant project scientist at UC San Diego School of Medicine, identified genetic markers for prostate cancer risk that may be specifically useful in men of African ancestry.

The addition of these new genetic markers to the PHS led to improved performance in identifying men of African ancestry at highest risk of prostate cancer and made the results more comparable to those of the other ancestry groups, said Minh-Phuong Huynh-Le, MD, who is first author of the Nature Communications paper and was a resident physician at UC San Diego Health during the study. Huynh-Le is now an assistant professor at George Washington University School of Medicine and Health Sciences.

"With only a blood or saliva sample, a man's genetic risk of prostate cancer can be estimated," said Huynh-Le. "Prostate cancer screening may reduce morbidity and mortality, but it should be targeted and personalized. Those at higher genetic

risk might benefit from earlier and/or more frequent prostate cancer screening, and this genetic tool could identify those individuals."

While the PHS has improved risk stratification, more needs to be done, said Seibert. Much of the data currently used for research continues to lack diverse representation. Even in the data for this study, researchers noted that most men of African genetic ancestry were missing clinical diagnosis information used to determine disease aggressiveness.

"This is particularly concerning, as race and ethnicity play an important part in prostate cancer risk. It is critical that we make sure these tools are designed to perform well in men of all ethnic and racial backgrounds," said Seibert. "These two papers are important steps toward that goal."

More information: et al, Polygenic hazard score is associated with prostate cancer in multi-ethnic populations, *Nature Communications* (2021). DOI: 10.1038/s41467-021-21287-0

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