Blood-borne HPV antibodies indicate head, neck cancer prognosis

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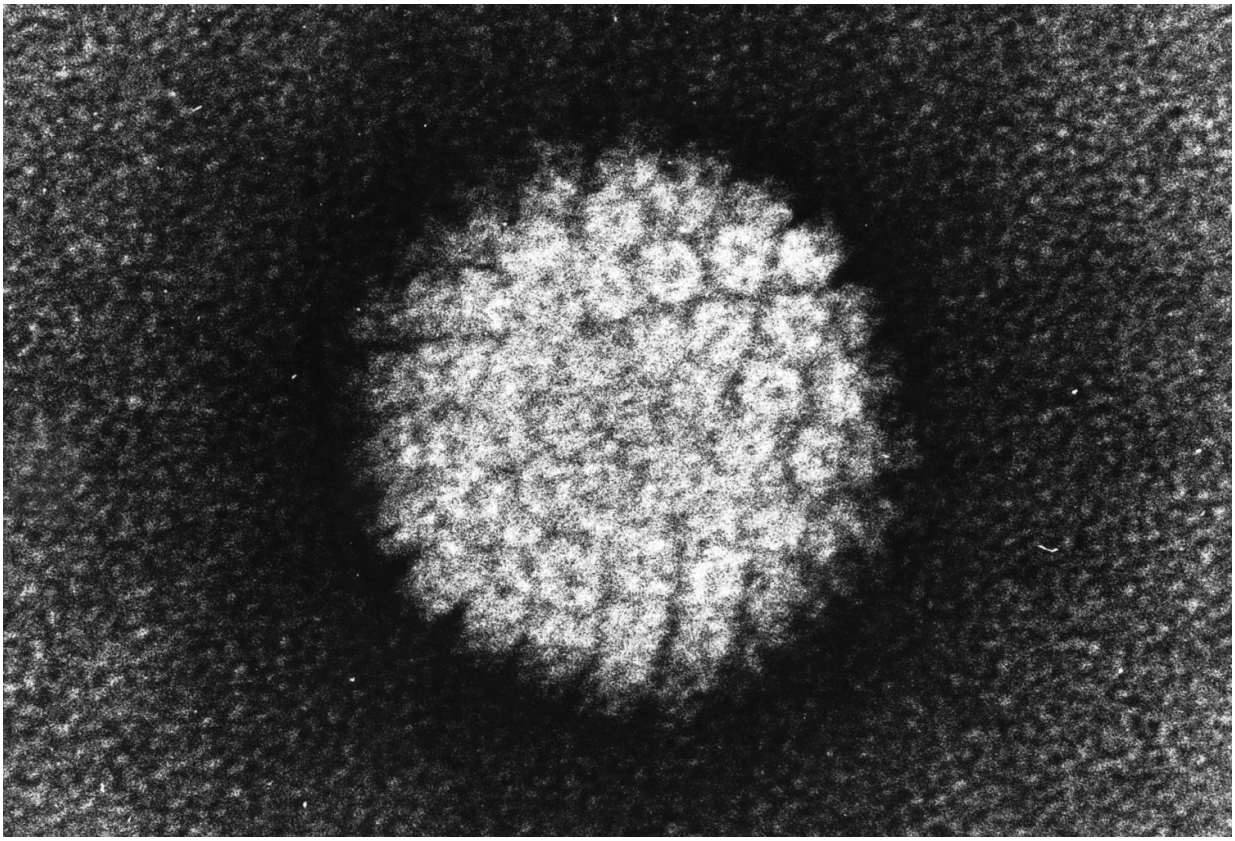

The human papillomavirus causes not only cervical cancer but also cancers of the head and neck. Credit: National Cancer Institute

People with head and neck cancers with evidence of human papillomavirus (HPV) infection generally have a better prognosis than

people without evidence of infection. A new study in *JAMA Oncology* suggests that to produce a strong, reliable prognostic signal, all that's needed is a blood serum test for two specific HPV antibodies, rather than lab work on a biopsy. Further, the researchers said, the study shows that this blood-based biomarker is predictive of outcome for all types of head and neck cancer.

"What this adds is that it helps us know how best to measure clinically the HPV contribution to this disease," said study senior author Karl Kelsey, a professor of epidemiology and of pathology and laboratory medicine at Brown University. Kelsey collaborated with lead author Heather Nelson of the University of Minnesota Masonic Cancer Center in making the findings.

Moreover, Nelson, Kelsey and their colleagues wrote, referring to the common HPV16 strain of the virus: "These data are among the first to demonstrate a convincing relationship between HPV16 and improved patient survival for tumors of the larynx and oral cavity."

Appraising antibodies

The study examined blood serum samples and five-year survival rates among more than 1,000 Boston-area head and neck cancer patients diagnosed between 1999 and 2011. Overall, those who tested positive for antibodies to the oncogenic HPV proteins E6 or E7 were less likely to die during the five year follow-up period after diagnosis compared to those who tested negative for the antibodies. Based on the analysis, the researchers estimated that those with evidence of an immune response to HPV were 25% less likely to die during the course of follow-up compared to those with no immune response to HPV.

The study's purpose was to determine whether the antibodies provide a reliable indication of prognosis. In ongoing trials, doctors are testing

whether patients with HPV-associated cancers can be treated less aggressively—and hopefully with fewer negative side effects—than people with non-HPV-associated cancers, Kelsey said. If trials prove successful, then it will be particularly important to determine whether cancers are HPV-associated.

"The assessment of a patient's HPV status likely will affect treatment," he said. "That's why there's real interest in getting it right; for instance, how do you test?"

Better prognosis across the board

Prior studies have focused primarily on the role of HPV in the oropharynx—the area of the throat right behind the mouth. An important contribution of the current study, Nelson said, is demonstration that an immune response to HPV is important for all forms of head and neck cancer, although the benefit does show some variance based on the exact cancer location. Those patients with an HPV immune response with tumors located in the oropharynx and larynx had a similar risk of dying during the follow-up period, though the reduced risk was slightly attenuated for those patients with tumors located in the oral cavity.

The results didn't depend significantly on whether people had high or low levels of the antibodies, so long as they had some, the researchers found, though testing positive for both E6 and E7 was better than for just one.

The reduced chance of dying by five years carried through for people who tested positive for the antibodies even if they consumed tobacco and alcohol. But the worst prognoses in the study were among smokers whose cancers could not be traced to HPV.

In all, the findings controlled for the statistical influences not only of tobacco and alcohol exposure, but also of age, race, gender, education and how far advanced the cancer was.

Relates to broader advances

Kelsey said the findings could help bring head and neck cancer treatment closer into line with two emerging practices of fighting the disease: personalized medicine and immunotherapy.

"To me, personalized medicine really reflects using all the information you can glean about an individual tumor to treat it appropriately," Kelsey said. "Here HPV is an example of a causal factor that delineates the mechanism of the tumor suppressor genes that drive the tumor and that gives you insight into the differences in the tumor."

Meanwhile, the study might help shed light on why immunotherapy—in which the body's immune system is marshaled to attack cancer—appears to help for some head and neck cancers, Kelsey said. It may not be coincidence, for instance, that the prognosis is better among people whose cancers are associated with a virus that promotes a robust immune response, in the form of antibodies, than among people without a viral cause for their cancer.

If HPV-related cancers can indeed be treated differently, Kelsey said, then serum-based testing to determine the role of the virus could soon be available, too.

Provided by Brown University

antibodies-neck-cancer.html