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HPV blood test shows promise for tracking head and neck cancer after treatment

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A new blood test developed by University of North Carolina Lineberger Comprehensive Cancer Center researchers shows promise for tracking HPV-linked head and neck cancer patients to ensure they remain cancer-free after treatment.

Researchers will present preliminary findings at the 60th Annual Meeting of the American Society for Radiation Oncology in San Antonio on Tuesday, Oct. 23. Their study evaluated a blood test for HPV-linked oropharyngeal squamous cell carcinoma, which is a cancer of the back of the throat. The findings demonstrated the test could be an effective and less costly alternative for monitoring for cancer recurrence after radiation treatment.

"The goal of this study was to evaluate whether this test can be used to track patients who are completely asymptomatic, and thought to have no active cancer," said UNC Lineberger's Gaorav P. Gupta, MD, Ph.D., assistant professor in the UNC School of Medicine Department of Radiation Oncology. "We already knew that our test was very sensitive and specific, but we did not know the degree to which it would be useful in early detection of disease recurrence in patients who are otherwise thought to be disease-free."

HPV, or the human papillomavirus, is the most common cause of sexually transmitted infection in the United States, according to the U.S. Centers for Disease Control and Prevention. Infection with certain strains of HPV can cause cervical cancer in women, genital cancers in

both men and women, and cancer of the oropharynx, which is the back of the throat, including the base of the tongue and tonsils. The CDC estimates that approximately 70 percent of oropharyngeal cancer cases diagnosed in the United States are probably caused by HPV, which accounts for nearly 13,000 cases per year.

Gupta and his colleagues developed a blood test that can detect fragments of HPV's genetic material that have been released into the blood by dying cancer cells.

"We realized it is important to distinguish HPV DNA that's being released by dying tumor cells from the natural HPV DNA that is present during a viral infection," Gupta said. "Our method accomplishes this feat, thus making it a more sensitive and specific test for cancer."

For their study, the researchers followed 89 patients with HPV-associated oropharyngeal squamous cell carcinoma who received chemotherapy and radiation treatment. They administered the blood test before and during treatment, and then during follow-up visits. The patients received scans three months after treatment, and then came back for clinical exams every two to four months during the first two years, and then every six months in years three through five. Patients received X-rays or CT scans every six months, and again if they had positive HPV results.

"We are detecting subclinical disease with this blood test, and the imaging patients received confirmed those findings," said UNC Lineberger's Bhishamjit S. Chera, MD, associate professor in the UNC School of Medicine Department of Radiation Oncology and the study's co-corresponding author. Chera presented the findings from the study at the ASTRO meeting.

Of the 70 patients whose blood tests were negative three months after

treatment, none developed recurrence. Nineteen patients had positive blood tests, and eight of those patients developed recurrence. Physicians are continuing to monitor the remaining eleven who had positive blood tests but no evidence of recurrence.

"The most striking finding of our study is that of the patients who did not have any signal using our blood test, none of them developed disease recurrence," Chera said. "That raises the question: Do we need to be scanning these patients? Scans come with a lot of cost, and because of the cost, we're not able to do it as frequently. Patients end up having a lot of anxiety from one scan to the next, wondering if their cancer has come back. This blood test could spare patients the need for additional imaging and potentially alleviate some anxiety."

The researchers say the next steps will involve investigating whether the test can be used prospectively to monitor patients and to make decisions that could avoid unnecessary imaging, thereby reducing costs. They also see additional applications for the blood test, including monitoring for other HPV-linked cancers, including cervical cancer.

"We are confident this blood test will be translatable to other cancers driven by HPV, and as a monitoring tool for cancer diagnosis," Chera said. "We strongly believe that this test may also have a role in screening, not just for oropharyngeal cancer, but also cervical or anal cancers, possibly in a general population setting, or at least in patients who may be at higher risk of developing these conditions."

In addition to Chera and Gupta, other authors include Sunil Kumar, Ph.D.; Colette Shen, MD, Ph.D.; Robert Amdur, MD; Roi Dagan, MD; Jared Weiss, MD; Juneko Grilley-Olson, MD; Adam Zanation, MD; Trevor Hackman, MD; Jeff Blumberg, MD; Samip Patel, MD; Brian Thorp, MD; Mark Weissler, MD; Nathan Sheets, MD; and William Mendenhall, MD.

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Intellectual property related to the test and held by the University of North Carolina at Chapel Hill has been licensed to Naveris, a company in which Chera and Gupta hold equity stakes.

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