Blood tests could predict survival odds for patients with metastatic cancer

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By measuring the amount of DNA in the bloodstream that's been shed by a tumor, liquid biopsies can help guide treatment discussions for patients with metastatic cancer. Credit: Justine Ross/Michigan Medicine

As cancers grow and potentially spread to new parts of the body, they often shed cells and DNA into the blood stream. DNA can be analyzed for both the amount of DNA present and whether any potential mutations exist that may aid providers in deciding on treatments.

These tests, known as liquid biopsies, have become standard practice for certain types of cancer, especially those for which there are drugs that target distinct DNA mutations. Whether liquid biopsies could help providers understand which patients may do better than others, though, is unknown.

DNA found in the blood may also be from normal cells. Measuring the amount of DNA that's been shed by a tumor compared to the body's typical amount of DNA, defined as the tumor fraction, may be a new tool to predict survival and guide treatment discussions for patients whose cancer has spread from the breast, prostate, lung or colon, a new study finds.

When tumor DNA made up at least 10% of the DNA in the bloodstream of patients with metastatic cancer, researchers discovered, those patients were much less likely to survive than those with less tumor DNA in the bloodstream, across all cancer types studied.

The measurement was just as accurate when it looked at patients with metastatic breast or lung cancer who had less than 1% of tumor DNA in their bloodstreams; these patients had a better chance of living longer than patients with more tumor DNA in the bloodstream.

"There are two reasons to look at anything analytically like this in a patient's tumor," said first author Zachery Reichert, M.D., Ph.D., a clinical associate professor and medical oncologist who specializes in urologic oncology at the University of Michigan Health Rogel Cancer Center. "One is it tells you what to do next. The other is it can help you counsel a patient on what to expect."

"In several cancers, we have multiple options for treatment without knowing which one is better for whom," he continued. "A better understanding of the disease risk will help the patient and provider better

balance the treatment risks."

These blood tests are the latest iteration of liquid biopsies, tests that can tell you whether there are cancer cells (or in this case, smaller DNA fragments) circulating in your sample of blood.

Despite initial hype, liquid biopsies aren't the ultimate cancer-screening solution for everyone. But they are shaping up to be useful for people who already have cancer and are weighing treatment options.

"We often end up falling back on the idea that a patient has 'good' disease or 'bad' disease, this rudimentary gut feeling, of which the accuracy is questionable," Reichert said. "I think that's a lost opportunity for being able to counsel patients more effectively. Now for diseases when a liquid biopsy is offered as standard of care, it can provide some context that may not only be predictive for what to do, but also what to expect for results, and that's something we can discuss with patients."

These liquid biopsies were less successful at predicting survival for patients with lung cancer who had an EGFR+ mutation and for those with brain metastases—results that don't surprise Reichert.

This test may not be well suited to brain mets, for instance, because the cancerous cells likely don't shed as much DNA into the bloodstream due to the blood-brain barrier. And there's a targeted treatment for the EGFR mutation that is so effective the amount of cancer present may not be as important.

More research will be needed to confirm the findings of this study, but the fact that the tests successfully predicted survival across all cancer types is encouraging, Reichert said. "The ability to counsel patients better and help people make the best shared decision for their next therapy could have a big impact."

The research is published in the journal *Annals of Oncology*.

More information: Z.R. Reichert et al, Prognostic value of plasma circulating tumor DNA fraction across four common cancer types: a real-world outcomes study, *Annals of Oncology* (2022). DOI: 10.1016/j.annonc.2022.09.163