Precision Oncology: What's in Store for Gene-Targeted Treatment?

For people with advanced cancer, this emerging area of treatment could hold incredible promise –– but critics are wary of its approach.

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In many cancer centers across the United States, doctors have begun to offer people with advanced disease the hope of "precision oncology" –– a new type of cancer treatment that matches patients with drugs tailored to their tumor's genome. But gene-targeted cancer drugs are the subject of fierce debate in the cancer research community. Are they worth it? A recent report in Science Mag overviews arguments on both sides of the story.

The article summarizes the arguments of two leading cancer researchers — David Hyman, MD, an oncologist at Memorial Sloan Kettering Cancer Center in New York and a leader of clinical studies testing the efficacy of precision oncology treatments, and Vinay Prasad, MD, of Oregon Health & Science University in Portland, author of several journal articles dispensing sharp criticism around issues in medicine, from drug pricing to conflicts of interest. They debated at a meeting of the American Association for Cancer Research (AACR) in Chicago early last week.

First, some background. Gene-targeted drugs for cancer date back to 1998, when Herceptin was approved for breast cancer treatment. Thus far, the Food and Drug Administration (FDA) has approved 31 targeted therapies for cancer, most of which work by blocking certain cancer-driving proteins or utilizing the body's own immune system to fight tumors. The field started to heat up significantly last year, when the FDA endorsed the first-ever "tissue-agnostic" cancer treatment, an immunotherapy drug that can fight any advanced solid tumor that has flaws in its genes that repair DNA.

To Hyman, this latest news signals a new era of cancer treatment—one in which more and more patients become eligible for immunotherapy (he estimates the current rate to be about 15 percent of total cancer cases at his hospital). The doctor is now calling for cancer patients to be tested broadly to determine whether they have a type of cancer that can be treated with gene-specific drugs.

But Prasad is skeptical about the number of patients who would benefit from the advancements. In one of his latest studies for JAMA Oncology, the researcher similarly found that 15.4 percent of 610,000 American patients with metastatic cancer were eligible for an FDA-approved precision

oncology treatment. But he also found that these drugs are effective only in a small percentage of patients, with a 22 percent overall response rate, and that just over 6.6 percent of those treated with the drugs likely benefited from immunotherapy at all.

The two young cancer researchers did agree on a few points—they concurred that far more research into this field is needed to broaden the impact of this kind of cancer treatment across all cancer patients. And although the field is young, it saves thousands of lives every year. Hopefully, with more research and broader treatment access, the debate can one day be settled.
