Customized Immunotherapy Shows Promise for Lung Cancer

Cancer-fighting T cells led to complete or partial tumor remission in at least 25% of lung cancer patients.

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An immunotherapy approach using tumor-infiltrating lymphocytes (TILs)—selected immune cells with known cancer-fighting ability—showed promising activity against non-small-cell lung cancer in a small study, researchers reported at the American Association for Cancer Research (AACR) virtual annual meeting. Two out of 12 treated participants have had durable complete responses lasting about a year.

The regular AACR conference, planned for San Diego, was cancelled due to the COVID-19 crisis. Instead, AACR held a two-day virtual meeting this week, with a second meeting scheduled for June 22 to 24.

Ben Creelan, MD, of Moffitt Cancer Center in Tampa, presented findings from a Phase I study of customized TIL therapy for people with metastatic non-small-cell lung cancer.

The treatment involves a process known as autologous adoptive cell transfer. T cells that have a natural ability to attack cancer are collected from a patient's tumor biopsy sample. These cells are then multiplied in a laboratory and reinfused back into the same individual after administration of strong chemotherapy to kill off existing immune cells and make room for the new ones. Interleukin-2 is also administered to encourage further T cell proliferation in the body.

Iovance Biotherapeutics has previously reported promising results from a study of its TIL therapy lifileucel for people with advanced or metastatic melanoma. Some melanoma patients in early TIL studies conducted by the National Cancer Institute are still responding nearly a decade later. But unlike melanoma, which is a so-called hot tumor that attracts T cells, many solid tumors—including lung cancer—are cold tumors that often contain few T cells.

The 20 participants in this study had a median age of 54 years, and 20% had tumors with EGFR mutations. A majority had low PD-L1 expression and a low tumor mutational burden, two biomarkers associated with better response to immunotherapy. They had to have at least one cancerous lesion accessible for a biopsy, usually from a lymph node.

Tumor T cells were harvested, and while they were growing in the lab—a process that takes several weeks—the patient were treated another type of immunotherapy, the PD-1 checkpoint inhibitor Opdivo (nivolumab). Checkpoint immunotherapy works by unleashing T cells to attack cancer, but it only works if these cells are available to be mobilized. Those who did not respond to Opdivo were eligible for TIL therapy.

Of these 20 patients, four ended up not receiving TIL reinfusions. One person responded to Opdivo, one did not have enough T cells produced in the lab and two could not be treated for other reasons. Of the 16 people treated with TIL therapy, 12 could be evaluated, including one who was still awaiting a confirmatory CT scan to monitor progression.

The overall response rate for the 12 evaluable participants was 25%, including two people with ongoing complete responses for about a year so far and one with a confirmed partial response. Tumor remission was usually apparent on the first post-TIL scan. If the partial responder awaiting a scan turns out to also have a confirmed response, the overall response rate will rise to 33%, Creelan noted. The median overall survival cannot yet be determined because a majority of patients are still alive.

Most participants experienced adverse events, largely attributable to the chemotherapy or interleukin-2. These included nausea, diarrhea and blood chemistry abnormalities. A majority of side effects resolved 10 or more days after the TIL infusions, according to Creelan.

“TIL has manageable toxicity and capacity to achieve durable remission in metastatic non-small-cell lung cancer after nivolumab treatment,” the researchers concluded. They added that “TIL may be a promising option” for fit lung cancer patients who can tolerate the process.

Click here to read the AACR study abstract.
Click here to learn more about lung cancer.
Click here to read the story of a participant in one of the first TIL therapy trials for melanoma.
