Vaccines for Hard-to-Treat Cancers

A better understanding of how the immune system responds to cancer has renewed hopes

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Custom-made vaccines that train the immune system to recognize a patient's tumor continue to show promise for hard-to-treat malignancies, researchers reported at the American Association for Cancer Research Annual Meeting. Cancer vaccines previously fell out of favor after disappointing study results, but now, a better understanding of how the immune system responds to cancer has renewed hopes that they could halt disease progression, delay recurrence and perhaps even offer a cure.

One early trial found that pancreatic cancer patients who responded well to BioNTech and Genentech's personalized mRNA vaccine, dubbed autogene cevumeran, plus the checkpoint inhibitor Tecentriq (atezolizumab) and chemotherapy after surgery continued to have a lower risk for recurrence three years later. Eight of the 16 patients developed strong T-cell responses against tumor neoantigens. Two of the eight responders relapsed, compared with seven of the eight nonresponders.

Another Phase I study evaluated Transgene's TG4050, which employs a poxvirus vector to deliver tumor neoantigens selected using artificial intelligence tools. None of the 16 head and neck cancer patients who received the vaccine immediately after surgery, radiation and chemotherapy experienced recurrence during 18.6 months of follow-up.

A third trial tested Geneos Therapeutics GNOS-PV02, a DNA plasmid vaccine that encodes up to 40 selected tumor neoantigens plus interleukin 12. Of the 36 people with advanced liver cancer who received the vaccine plus Keytruda (pembrolizumab), 31% experienced tumor shrinkage. This is about double the response rate of patients treated with a checkpoint inhibitor alone in other studies. Treatment was intended to last for two years, but the median duration of response was not reached, and the study has been extended.

Finally, Diakonos Oncology's DOC1021, an engineered dendritic cell vaccine, may extend survival for people with glioblastoma brain cancer. After a year of follow-up, 12 of 16 vaccine recipients (88%) were still alive, well beyond the survival rate with standard care. Diakonos takes a different

approach, training a patient’s dendritic cells to recognize their tumor antigens. According to the company, this “tricks the body into perceiving cancer cells as virally infected cells, mirroring the natural detection and elimination process for viral infections.”
