

Adding Cell-Based Vaccine to Liver Cancer Therapy Slows Cancer Progression

Results of randomized Phase II ImmunoTACE trial saw an increase in progression-free survival time for hepatocellular carcinoma patients.

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Patients with intermediate stage primary liver cancer who received a vaccine of dendritic cells saw a longer time without tumor progression in response to standard treatment according to a new study funded by the National Institute for Health and Care Research and led by the University of Birmingham.

The results of the ImmunoTACE trial, the first clinical trial of its kind, published in Clinical Cancer Research today [August 26], found improved progression-free survival (PFS) for patients with hepatocellular carcinoma (HCC) who received the cell-based vaccine expanded from their own white blood cells, alongside usual treatment with tumor chemoembolization, a treatment for blood vessels that feed the tumor, alongside chemotherapy.

The collaborative trial between the University of Birmingham, University Hospitals Birmingham, Nottingham University Hospitals NHS Trust and Aintree University Hospital and Clatterbridge saw 48 patients recruited to receive either standard treatment alone or standard treatment plus a cellular vaccine using dendritic cells loaded with cancer antigens to stimulate immune responses against the cancer.

In the experimental arm of the trial the average time to progression of the tumour was 18 months compared with only 10 months in the group who only received standard treatment.

Professor David Adams, Chief Investigator of the study and Emeritus Professor of Hepatology at the University of Birmingham said: “The results from this phase II trial are very promising and offer a potential new treatment option for patients with primary liver cancer, one of the highest causes of cancer-related death worldwide.

“As far as we know, ImmunoTACE is the first controlled clinical trial to show that a cell-based vaccine using lab-grown dendritic cells can improve patient outcomes with liver cancer. The results warrant further investigation and could in future offer much needed hope and a better treatment

option for patients.”

Dendritic cell vaccine

The vaccine is made with dendritic cells (DC) which help orchestrate the immune system’s response to diseases including cancer by activating immune killer cells to recognise and destroy cancer cells.

The dendritic cells used in the study were expanded from the patients’ own white blood cells by growing them in a purpose-built laboratory for eight days with proteins taken from cancer cells. The cells allow the immune system to see these proteins and then to mount an immune attack on the cancer cells that bear them.

Patients received the DC vaccine at the same time as standard treatment with chemo-embolization and then monthly for a further three months.

While dendritic cells are produced naturally in the body, studies have shown that in patients with cancer they can become “exhausted” and stuck within the tumor rather than carrying cellular information back to the lymph nodes where they can activate immune killer cells. The idea of DC vaccine is to restore and uncover immune responses to the cancer. The current trial design reports that this therapy can be both affordable and effective.

Dr. Yuk Ting Ma, lead author of the study and Associate Clinical Professor at the University of Birmingham, and an Honorary Consultant in Hepatobiliary Oncology at the University Hospitals Birmingham NHS Foundation Trust said: “These are very promising findings that demonstrate the potential use of dendritic cell vaccines in a widely prevalent and hard to treat cancer. With our approach to developing the vaccine, focusing on stimulation with multiple tumour antigens, we have shown a strong signal that we believe warrants testing in larger trials in patients with liver cancer.”

“Dendritic cell vaccines also represent a potential additional immune therapy to add to current checkpoint inhibitors,” Ma continued. “Future studies will look at whether adding DC vaccination to standard immunotherapy can derive better outcomes for patient with HCC who show only modest responses to current checkpoint inhibitor drugs.”

Hepatocellular carcinoma is a common type of liver cancer which is the [sixth] most common cancer in the world and whose prevalence is increasing in the U.K. according to Cancer Research UK.

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