Positive early results in clinical trial of leukaemia vaccine

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Early results of a trial to treat leukaemia with a WT1 DNA vaccine, has shown robust vaccine-specific antibody responses in all vaccinated patients evaluated to date.

Furthermore, T cell immune responses, including those of the "killer T cells," were detected. Antibody and T cell responses are strong signals of the DNA vaccine's potential to treat the disease.

Presented at the DNA Vaccines 2012 conference in California by Christian Ottensmeier, the trial's principal investigator and Professor of Experimental Cancer Research at the University of Southampton, these interim results, from eight patients, are part of a phase II trial that will enroll 31 patients in its chronic myelogenous leukaemia (CML) arm.

To date, 14 CML patients have been enrolled while another 13 unvaccinated CML patients have been enrolled to serve as a control group. The vaccine has been shown to be safe overall and well-tolerated in the trial subjects. A detailed analysis of T cell immune responses as well as the impact of the vaccination on the molecular marker, BCR-ABL, which is a specific chromosomal abnormality that is associated with CML disease, will be performed during the trial.

As a result of the favourable safety and immunogenicity profiles observed in the CML vaccinated group, the trial is now open to enroll the acute myeloid leukaemia (AML) clinical trial arm, with a total target of 37 subjects in each of the vaccinated and control groups.

Professor Ottensmeier comments: "These preliminary data show strong vaccine-induced immune responses in vaccinated subjects in the CML arm. We are looking forward to enrolling and testing the vaccine's impact in AML patients, who currently have limited treatment options and a low rate of progression free survival."

This open-label, multi-center phase II clinical trial is evaluating a DNA vaccine-based immune therapy to treat these two types of leukaemia. The DNA vaccine, developed by the University of Southampton, is delivered using Inovio Pharmaceuticals, Inc proprietary electroporation technology. The trial is funded by research charity Leukaemia and Lymphoma Research (LLR) and the National Institute for Health Research Efficacy and Mechanism Evaluation Programme.

Leukemia is a cancer of the bone marrow and blood that accounts for at least 300,000 new cases and 222,000 deaths worldwide each year - a very high death rate. Wilms' Tumor gene 1 (WT1) is highly associated with these types of cancer. Preclinical data from mice showed strong induction of antigen-specific CD8+ T cells and the ability to kill human tumor cells expressing WT1. This is the first study to combine DNA vaccination with electroporation delivery of WT1 antigens with the goal of stimulating high and durable levels of immune responses, in particular T cells, which are considered critical for improving clinical outcomes for this disease.

In this ongoing phase II trial, all participants initially receive six doses of two DNA vaccines (called p.DOM-WT1-37 and p.DOM-WT1-126) delivered at four week intervals. Vaccine responders may continue with booster vaccinations every three months out to 24 months. An additional 60 to 75 AML/CML patients are being enrolled across the two arms as non-vaccinated controls for comparison. The primary endpoints are molecular response to a disease marker called BCR-ABL in CML patients and time to disease progression in AML patients. The study is

also monitoring WT1 transcript levels, immune responses to the WT1 antigen, time to progression and overall survival, and two-year survival in the AML group. The trial is taking place at hospitals in Southampton, London and Exeter.

Inovio's CEO, Dr. J. Joseph Kim, adds: "We are encouraged by preliminary phase II data showing a WT1 DNA vaccine's potential, administered with our novel delivery technology, to generate T cells and robust antibodies to treat leukemia. These results follow on our recent scientific breakthrough represented by our human data showing the powerful killing effect of T cells generated by our cervical dysplasia therapeutic vaccine."

Provided by University of Southampton