Largest gene therapy trial for cystic fibrosis begins

March 16 2012

The trial will see patients 'breathe in' the gene therapy using a nebulizer.

(Medical Xpress) -- British scientists are to carry out the largest trial anywhere in the world of a gene therapy for cystic fibrosis.

A consortium of researchers from Oxford University, Imperial College London and the University of Edinburgh will start enrolling patients on the trial this month.

The UK Cystic Fibrosis Gene Therapy Consortium hopes that the study

will show for the first time whether the gene therapy they have developed can improve the health of patients. The phase two clinical trial will involve 130 cystic fibrosis patients using an inhaler to breathe in a working copy of the cystic fibrosis gene once a month for a year.

The trial will go ahead thanks to £3 million in funding from the Medical Research Council (MRC) and the National Institute for Health Research (NIHR) that is announced today.

Additional laboratory studies to develop a potentially more efficient delivery method for the gene therapy will receive a further £1.2 million in support from the MRC.

"No one has ever done a gene therapy study like this in cystic fibrosis before," said Dr. Deborah Gill of the Nuffield Department of Clinical Laboratory Sciences at Oxford University. "It's a worldwide first in terms of the length of the study, the number of patients involved and the number of doses of gene therapy. By giving the therapy over a whole year, we will have the best chance yet of seeing an improvement in patients."

Professor Eric Alton, the coordinator for the consortium from Imperial College London, said: 'Conventional treatments have extended the life expectancy for people with cystic fibrosis. We're hoping that this therapy will achieve a step change in the treatment of cystic fibrosis that focuses on the basic defect rather than just addressing the symptoms.

"This trial will assess if giving gene therapy repeatedly for a year will lead to the patients' lungs getting better. Eventually we hope gene therapy will push cystic fibrosis patients towards a normal life expectancy and improve their quality of life significantly."

Cystic fibrosis is an inherited disease that affects around 9,500 people in

the UK. There is currently no cure and the only available treatments rely on alleviating the symptoms, not treating the underlying cause. The average life expectancy for cystic fibrosis patients is only 35 years.

The disease is caused by a single faulty gene that leads to thick, sticky mucus to build up in the lungs and digestive system.

The researchers in the UK Cystic Fibrosis Gene Therapy Consortium have developed a successful method for delivering a working copy of the defective gene directly into the lungs of patients.

The gene is administered via a nebulizer – much like inhalers used in asthma. Patients simply inhale a fine mist of fat globules which carry the DNA for the gene wrapped up inside.

The researchers have previously shown in smaller-scale clinical trials that their nebulizer approach can get a working copy of the cystic fibrosis gene into the cells of the lung, and that the gene continues to work for a period of weeks and months.

The new clinical trial will assess whether the gene therapy can provide measurable clinical benefits for people with cystic fibrosis. That is: whether it can actually improve people's lung function, and reduce the amount of mucus, inflammation and infection seen in patients.

Patients will be seen at the Royal Brompton Hospital, London, and the Western General Hospital and the Royal Hospital for Sick Children, Edinburgh.

The second lab-based study, with a further £1.2 million in funding from the MRC, will investigate a potentially more efficient delivery method for the gene therapy. The aim is to use a modified virus to carry the replacement gene into the lungs, which could lead to an even more

effective treatment in the future.

Dr. Gill said: "The new virus delivery approach has never been tried before but it could be more efficient. It is specifically designed to deliver the gene therapy to the lungs, but it will take several more years of development before it gets to the point of human trials."

The consortium's research, which has been supported by the Cystic Fibrosis Trust for a decade, had faced an uncertain future due a funding shortfall. The new funding from the MRC and NIHR will ensure the next stage of the research can continue as planned.

Professor Eric Alton of Imperial College London said: "With funding for this key part of the consortium's program secure, we will begin preparations for the trial immediately."

The outcome of the phase two trial will be known in spring 2014 and regular progress reports will be posted on the UK Cystic Fibrosis Gene Therapy Consortium's website.

Dr. Gill said: "A lot of cystic fibrosis patients in this country have either been directly involved in trials or in fundraising to support the research. That this new trial is going ahead is a really great result for everyone. It could find out if gene therapy has a chance of working for all cystic fibrosis patients."

Provided by Oxford University