

Personalising treatment for Parkinson's



Project information

Lead researcher	Dr Ashwani Jha
Location	Institute of Neurology, UCL
Cost	£173,953 over 3 years
Start date	June 2009
Type of project	Training fellowship
Project code	F-0903

Project background

It's well known that the rhythm of electrical signals used by nerve cells within the brain to communicate with each other is changed in Parkinson's. Successful treatments – whether they're drug-based or surgical – can change this unusual electrical activity and therefore help to reduce the symptoms. However, we don't really understand how exactly this altered brain activity relates to the specific symptoms that people experience or whether we could use this knowledge to develop more effective treatments.

- **People with Parkinson's have a great range of different symptoms.** The ideal therapy should therefore target the areas of the brain and patterns of nerve cell activity that are associated with the specific symptoms.
- **Nerve cells in the brain use electrical signals to communicate.** In order to move, for example, a signal is sent from the part of the brain which is responsible for "thinking" to the part that controls movement. But the problem is that nerve cells in that part of the brain die in Parkinson's so no signals can get through.

- **Deep brain stimulation is a surgical treatment for Parkinson's.** This involves the insertion of a wire electrode into the brain. This is connected to a battery (like a pacemaker) that is usually placed under the skin in the chest. This generates small electrical currents to stimulate a particular part of the brain to try to overcome some of the problems associated with Parkinson's. These electrical signals then need to be adapted individually for each person so that the treatment deals with their specific symptoms.

What the researchers are doing

The aim of this project is to identify patterns of electrical brain activity that match up with specific symptoms. The team will use a scanner to record the electrical activity of nerve cells on the surface of the brain (called the cortex). And because the participants have previously had electrodes placed within the brain for treatment with deep brain stimulation, the researchers will also be able to record activity from deep within the brain. They can then try to find out whether the changes in the electrical activity deep in the parts of the brain affected by Parkinson's can be easily measured in the cortex. The aim is to identify patterns of electrical brain activity that match up with specific symptoms.

Progress so far

So far 13 participants have been recruited from London and Oxford, so the researchers are well on target to examine the 25 people that will be needed in the study. The researchers have been developing specific clinical tests that will allow them to see what parts of the brain are responsible for specific tasks, particularly those that may be affected by their Parkinson's.

What is the next stage?

The participants will be asked to do a set of tasks that activate different brain regions such as starting a movement, as this is a key problem in Parkinson's. Then the researchers will measure the electrical currents both deep within the brain as well as at the surface. They can then identify which electrical currents are associated with specific tasks.

How the research will help people with Parkinson's

The ultimate goal is to try to develop a method to correlate the electrical activity at the surface of the brain (which can be measured from the outside) with that deep in the brain – the area affected by Parkinson's. We can then measure much more accurately what is happening in the brains of people with Parkinson's and may therefore be able to target the therapy much more accurately. We can be much more effective in treating people with different symptoms if we can understand what is actually happening in the brain. The career development award will allow Ashwani to develop his career in the area of Parkinson's research and he will be working at one of the top research institutions in the UK.

For more information, please talk to the Research Team

Call	020 7963 9313
Email	research@parkinsons.org.uk
Write	Parkinson's UK, 215 Vauxhall Bridge Road, London SW1V 1EJ