

Discovery will assist treatment and research into fatal brain disorder

June 17 2008

Research using newly developed Magnetic Resonance Imaging technology could soon allow clinicians to confirm Huntington's disease before symptoms appear in people who have the gene for the fatal brain disease.

An early confirmation of Huntington's disease in people who have tested gene positive for the disease could enable treatment to commence early, even before motor, cognitive and psychiatric symptoms arise.

Using Diffusion Magnetic Resonance Imaging (dMR), researchers from the Howard Florey Institute and Monash University in Melbourne have identified extensive white matter degeneration in patients recently diagnosed with Huntington's disease.

White matter forms the connections between brain regions, allowing one region to communicate with another. A breakdown of these structural connections in the brain could help to explain the complex motor and cognitive problems experienced by Huntington's disease patients in the early stages of the disease.

Scientists have recently shown that this white matter degeneration starts before patients are officially diagnosed however, the extent of white matter degeneration in Huntington's disease was previously unknown.

The early symptoms of Huntington's disease can be easily missed, as they are usually minor problems such as clumsiness, memory loss and

loss of cognitive function.

These symptoms gradually become more severe over the years, inevitably leading to death within 15 to 20 years of diagnosis.

Working on this research was Florey PhD student Ms India Bohanna, who said this discovery could also assist in the future testing of new therapeutic strategies to treat the disease.

"Currently, the effectiveness of any new treatment is determined by its ability to reduce symptoms, but we know that changes in the brain occur a long time before symptoms arise," Ms Bohanna said

"Our discovery could allow researchers to test therapies even before symptoms appear.

"Not only does this research tell us more about how the brain degenerates early in Huntington's disease, but it also opens up new avenues in drug research and development.

Co-principal investigator, A/Prof Nellie Georgiou-Karistianis from Monash University explained, "By using diffusion MR to examine white matter degeneration early on, we can now test the ability of new therapeutics that may possibly reverse underlying degeneration in brain connections, which ultimately leads to the development of symptoms.

"Although there isn't yet a cure for Huntington's, researchers at the Florey and Monash, and from around the world are working to develop new treatments to delay the onset and severity of this devastating disease," A/Prof Georgiou-Karistianis said.

Collaborating on this project was the Florey's A/Prof Anthony Hannan, who has shown that mental and physical exercise can delay the onset of

Huntington's disease and slow the progression of symptoms in a mouse model of the disease.

This is the first study to look at white matter changes across the whole brain in Huntington's disease, and importantly, to study how the breakdown of connections between brain regions might lead to the widespread deficits found in Huntington's disease patients.

The researchers hope to conduct further dMR studies to examine white matter degeneration in people who have tested gene positive to Huntington's disease but are up to 10 years away from developing symptoms.

Huntington's disease is an inherited disease caused by a mutation in a single gene and is inherited by 50 percent of the offspring of patients. The disease usually appears around middle age but can start in childhood. Huntington's disease affects approximately 7 people per 100,000 of the population in Australia.

Diffusion Magnetic Resonance Imaging is a recently developed brain imaging technique that enables examination of the brain at a microstructural level and the mapping of white matter tracts by tracking the movement of water in the brain.

This research will be presented at the 14th Annual Meeting of the Organisation for Human Brain Mapping, which opened on 15 June in Melbourne. This conference, supported by the Howard Florey Institute, will see the world's neuroimaging experts share their latest research and develop new collaborations.

This research has also been accepted for publication in *Brain Research Reviews*.

Source: Research Australia

Citation: Discovery will assist treatment and research into fatal brain disorder (2008, June 17)
retrieved 18 April 2024 from

<https://medicalxpress.com/news/2008-06-discovery-treatment-fatal-brain-disorder.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.