New research works towards early diagnosis of Parkinson's disease

May 4 2011

An international team of researchers has moved forward the development of diagnostic biomarkers for degenerative disorders such as Parkinson's.

The team, made up of researchers from Lithuania, Russia and Sweden, investigated how a simple blood test that measures antibodies which cause the disease could help bring about earlier diagnosis. At the onset of Parkinson's disease the human body generates antibodies to combat the amyloid-producing protein alpha synuclein.

By finding out more about how these antibodies work, the team hope to see earlier diagnosis that will in turn enable treatment to be carried out at a stage when the disease is most responsive to intervention, i.e. the period when the greatest number of nerve cells are being damaged or dying.

And the study is not just relevant for Parkinson's sufferers, as other neurodegenerative diseases like Alzheimer's are also caused by proteins that lump together into so-called amyloid. In the study, published in the journal PLoS One, the team sets out how they found endogenous antibodies that act against the most important amyloid-producing protein in Parkinson's disease, antibodies that could function as a diagnostic marker for the disease.

The study shows that monitoring the levels of endogenous antibodies in patients' blood serum is a relatively simple process and would only

require a blood sample to be taken, which, they advise, should become a common method in clinical practice.

The implications of this study for Parkinson's disease - and indeed all neurological disorders - are far reaching. They show us that autoimmunity may play a protective role in Parkinson's disease and therefore immune reactions to the disease's most significant amyloid-producing protein alpha synuclein may be of value to treatment strategy development through vaccination with amyloid antigens and antibodies, particularly in the early stages of the disorder.

The World Health Organization (WHO) defines neurological disorders as diseases of the central and peripheral nervous system, i.e. diseases that affect the brain, spinal cord, cranial nerves, peripheral nerves, nerve roots, the autonomic nervous system, neuromuscular junction and the muscles.

In addition to Parkinson's disease and Alzheimer's disease, these disorders include epilepsy, several forms of dementia, cerebrovascular diseases including strokes, migraines and other headache disorders, multiple sclerosis, neuroinfections, brain tumours, traumatic disorders of the nervous system such as brain trauma and neurological disorders as a result of malnutrition.

The European Parkinson's Disease Association estimated that in 2004 6.3 million people worldwide were suffering from Parkinson's. The age of onset is normally after 60, but 1 in 10 people are diagnosed before the age of 50. In general, women are more susceptible to the disease than men.

Alzheimer's disease is a degenerative brain syndrome characterised by a progressive decline in memory, thinking, comprehension, calculation, language, learning capacity and judgement. The WHO states that,

globally, around 5% of men and 6% of women over 60 are affected with Alzheimer's disease, and as populations age this ?gure is only set to increase making the need for early diagnosis of neurodegenerative diseases even greater.

More information: Yanamandra, K., et al. (2011) a-Synuclein Reactive Antibodies as Diagnostic Biomarkers in Blood Sera of Parkinson's Disease Patients. *PLoS One* 6(4), e18513.

Provided by CORDIS