

## **EANM PRESS RELEASE**

### **Parkinson's disease: getting the diagnosis straight**

#### **EANM: nuclear imaging renders examination of neurological conditions more precise**

**(Vienna, 4 December 2012) To make sure whether a patient has Parkinson's disease or a different condition with similar symptoms can be quite a challenge in clinical practice. "A nuclear imaging technique, especially developed for this purpose, provides doctor and patient with a highly reliable diagnosis, which is crucial for planning the most efficient treatment right from the start," says Professor Jan Booij, expert of the European Association of Nuclear Medicine (EANM).**

Being diagnosed with Parkinson's disease (PD) is a heavy blow for the affected patient as well as for his loved ones. According to its progress, this chronic neurological disease causes increasing deficits in motor function: movements become reduced and slower than normal. Patients also frequently suffer from stiffness of their arms and legs, often accompanied by tremor. Usually, cognitive problems arise in the more advanced stages and worsen the patients' state of health. This might comprise severe memory restrictions as well as a loss of mental flexibility and lack of orientation. The PD risk rises with age. In industrialised societies an average of about 1% of those over 60 years of age suffers from PD with considerable variation between populations. The percentage of the affected is even fourfold among those over 80 years of age.

#### **An early and accurate diagnosis is essential**

In spite of its frequency and the considerable burden for the patients as well as for the health-care system, scientists have not been able to unravel the causes of PD so far. Possible genetic as well as environmental factors are being investigated. Although there is still no cure for PD, appropriate medical treatment and efficient disease management can help to maintain quality of life over a considerable period of time. "To achieve this, an early and accurate diagnosis which makes sure whether a patient's symptoms are really PD-related is essential," says Prof. Jan Booij. "This is quite a challenge in clinical practice as incapacities typical for PD can also be caused by other diseases, which require different treatments."

This is where nuclear imaging techniques come into play as they can visualise those neuronal processes which clearly indicate PD. In the human brain, communication between nerve cells (neurons) is maintained by their ability to transduce signals to one another. This signal transduction, by the release of chemicals known as neurotransmitters, is thought to be an important component of cross talking between nerve cells. One of these neurotransmitters is called dopamine. Although dopamine-producing neurons constitute less than 1 in every 100,000 cells in the brain, the dopaminergic neurotransmission system plays a pivotal role in the regulation and control of movement. These dopaminergic neurons in particular are lost in

patients suffering from PD, and this loss of cells is believed to cause many of the symptoms. The medical treatment consists of drugs that can replenish the dopamine in the brain.

### **Providing visual evidence**

According to Prof. Booij, it is now possible, due to recent scientific and technical developments, to visualise and quantify dopaminergic neurons in the brain of patients with an imaging technique called SPECT (single photon emission computed tomography). To perform this diagnostic test, a vein in the patient's arm is injected with a very small amount of the radiotracer DaTSCAN, a substance containing a small amount of radioactivity. This radiotracer binds to the surface of nerve cell endings, which are responsible for the transport of dopamine. During this process, radioactive rays are emitted which can be captured by a specially designed camera circling around the patient's head and creating a computer image of the distribution of the tracer within the brain. This enables the examining expert to detect loss of dopaminergic cells in patients with PD. Several studies have found that by this method PD can be distinguished in a highly reliable manner from other conditions such as the relatively benign "essential tremor". "The results of recent large studies show that patients benefit greatly from this gain in diagnostic precision as their doctors can outline the most suitable treatment and disease management right from the start," says Prof. Booij. With the help of the EANM, the imaging procedure has been standardised in most European nuclear medicine centres.

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