

Cognition: Education and occupation and their associations with Parkinson's Disease

Parkinson's Disease is a progressive neurological condition caused when the balance in the brain between dopamine and acetylcholine is upset by the loss of dopamine. Normally these two chemical messengers work in balance to transmit messages between nerve cells and muscles, enabling a person to perform a whole raft of co-ordinated movements. However, in people with Parkinson's Disease this balance is upset because some of the dopamine-producing cells are lost.

The symptoms of Parkinson's Disease appear once a person has lost about 80% of their dopamine. Most people associate Parkinson's Disease with having tremors and indeed about 70% of sufferers have a tremor, usually beginning in a hand or arm with the tremor being more likely to occur when the affected part of the body is resting. The other two main symptoms of the disease are muscular rigidity or stiffness and bradykinesia (the slowed ability to start and continue movements, and impaired ability to adjust the body's position). Muscular rigidity or stiffness can make everyday tasks difficult and often quite painful to perform. Even very simple movements such as getting out of a chair or turning over in bed can be affected. Some sufferers may find that their facial muscles become stiff, making facial expressions more difficult.

As well as these three main symptoms, people with Parkinson's Disease may find that they experience other symptoms such as tiredness, depression and problems with balance. The symptoms usually begin slowly, develop gradually and in no particular order although muscular rigidity or stiffness is a common early sign of the disease. Parkinson's Disease is very individual in nature and so the type, severity and rate of progression of symptoms varies enormously from one sufferer to another. Indeed, it may take years before someone finds their symptoms have become a major problem for them.

There can be no doubt about that Parkinson's Disease is an incurable and debilitating condition and one that is fairly common. In the UK alone, one in 500 people (approximately 120,000 individuals) suffer from Parkinson's Disease with about 10,000 people a year being diagnosed with the disease. Globally, the figure for sufferers is estimated to be in the region of 4 million people. Usually symptoms appear after the age of 50, although around 1 in 20 of the new cases diagnosed each year in the UK is found to be in people under the age of 40. The risk of getting Parkinson's Disease increases with age, with men being slightly more likely than women to develop the disease. (statistics from the Parkinson's Disease Society).

Recent research has also highlighted the fact that a person's occupation and number of years of education can increase the risk of developing Parkinson's Disease. The

study, carried out by a team of researchers from the Mayo Clinic, Minnesota, USA found that people with higher education and physicians had an increased risk of Parkinson disease, while others engaged in some occupations that presumably involved high physical activity had a decreased risk of developing the disease.

The research team used the medical records-linkage system of the Rochester Epidemiology Project to identify everyone who had developed Parkinson's Disease in Olmsted County, Minnesota, from 1976 to 1995. Each incident case was matched by age (+/-1 year) and sex to a general population control. Details about the education and occupations of the participants were collated using two independent sources of data: a review of the complete medical records in the system and a telephone interview. Participants' occupations were coded using the 1980 Standard Occupational Classification.

The results showed that people with 9 or more years of education were at increased risk of developing Parkinson's Disease (OR = 2.0; 95% CI = 1.1 to 3.6; p = 0.02), with a trend of increasing risk with increasing education. When looking at occupations, physicians were found to be at a significantly increased risk of developing the disease, whereas construction and extractive workers (e.g., miners, oil well drillers), production workers (e.g., machine operators, fabricators), metal workers, and engineers showed a significantly decreased risk. These associations with increased or decreased risk did not change noticeably after adjustment for education.

This research, of course, raises the question as to why the risk of developing Parkinson's Disease may be connected with the amount of education you have received or the work that you do. At present, the reason why the loss of dopamine occurs in the brains of people with Parkinson's Disease is unknown and it may be that it is a combination of factors that causes someone to develop the disease. For now, research continues but every piece of new evidence that comes to light is putting us one step closer to understanding and, hopefully, curing this disease.

References:-

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Parkinson's Disease Society www.parkinsons.org.uk