

**INTERNATIONAL COFFEE ORGANIZATION**  
**POSITIVELY COFFEE PROGRAMME - COFFEE AND PARKINSON'S DISEASE**

## **Coffee and Parkinson's Disease – an Overview**

Parkinson's disease is one of the most well known of all neurological disorders. It is found all over the world and an estimated four million people are affected worldwide. Symptoms usually appear after the age of 50 and the risk of developing Parkinson's increases with age. Three percent of the population over 65 is affected and this increases dramatically between the ages of 70 and 85 (1).

The main symptoms are muscle stiffness, slow movements and tremor, although some also suffer from imbalance and problems with communication, such as writing, speech and facial expression. The symptoms begin to appear when the brain cannot produce enough dopamine, a chemical messenger responsible for transmitting signals within the brain. This occurs when dopamine-producing nerve cells, or neurons, in a part of the brain called the substantia nigra, die off, and there is not enough dopamine produced to control the nerves and muscles involved in balance, walking and other movements. Unfortunately the symptoms only become evident when 60-80% of these specialized neurons have been lost.

Scientists have speculated for more than a century about what causes Parkinson's and the mystery of why these particular nerve cells die. However most now agree it is a combination of genes, lifestyle and environment factors that trigger the disease.

Researchers first observed that caffeine could help overcome stiffness and mobility in animal studies. Human studies also suggest that coffee and caffeine consumption are inversely related to the relative risk of developing Parkinson's disease. As early as 1968, an epidemiological study reported a higher percentage of coffee consumers in a control group, than in the group with the disease (2). Subsequent studies in Spain (3) Sweden (4) and Germany (5) found also that coffee consumption before the onset of the disease was significantly lower in those individuals affected, than those not affected by the disease. A more recent study (the Honolulu Heart Program) on 8,004 Japanese American men living in Hawaii and followed over a period of 27 years, also reported an inverse relationship between the incidence of Parkinson's disease and coffee. Those that drank more than four cups of coffee a day were five times less likely to develop the disease than those who drank no coffee (6).



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Similar conclusions were reached in two other American studies. The first started in 1986 and involved 47,351 men and 88,565 women (7). In this study the effect could be more dramatically seen in men, when the intake of caffeine was equivalent to only one cup a day. The second study (8), involving 2,715 subjects of both sexes over the period 1992 – 2000, confirmed the reduced risk in persons drinking two cups of coffee daily.

Generally the data are more confusing in women. Some studies find a moderate consumption of caffeine being protective in postmenopausal women, with the reverse effect being seen case in women who were taking oestrogens, and drinking six or more cups of coffee daily (9).

All of these studies, with the exception of study 9, however show that coffee consumption reduces or delays the development of Parkinson's disease and caffeine is the most likely factor. What the mechanism of action is for this protective effect is not entirely clear. Recent experimental research has shown that caffeine blocks a type of brain receptor called adenosine A2A. These receptors work in conjunction with dopamine D2 receptors, and caffeine, by blocking the A2A receptors, enables the D2 receptors to be stimulated, thus increasing motor activity and movement.

It would also appear that caffeine could have protective properties on the nerves and in various animal model studies (10, 11), when used in conjunction with L-dopa, the well-established drug treatment for Parkinson's disease, it can be shown to slow down the degeneration of dopamine producing cells, thus making their combined use an exciting possible strategy for treatment of such a debilitating disease in the future.

In conclusion there is now well-recognized and convincing evidence from numerous studies that coffee and caffeine consumption decreases the risk of Parkinson's disease, with the possible exception of women undergoing hormone therapy. There is additional scientific data that suggests that caffeine can help to relieve the symptoms of the disease and have a protective effect on the nerve cells.



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