Reduced Risk for Parkinson's Disease in Smokers

The possibility that the incidence of Parkinson's disease may be reduced by smoking has received widespread recent publicity. This may seem a bizarre idea, but several epidemiological studies, from countries as diverse as Italy, China, and the USA have provided supporting evidence for it. Indeed, it is possible that stopping smoking is a risk factor for Parkinsonism.

In an article recently published in this journal, the current author suggested that Parkinsonism is elevated in regions where glaciation has removed iodine from the soils. It was argued further that exposure to such an iodine deficiency during gestation and infancy increased the number of dopamine receptors in the brain and so raised susceptibility to dopamine oxidation. Such dopamine deficiency is known to cause elevated cytotoxic glutamate levels. The author termed this process the iodine-dopachrome-glutamate hypothesis.

If this hypothesis is correct and smoking really does protect against Parkinson's disease, there must be some substance(s) in cigarette smoke that mitigates glutamate's neurotoxic effects. The most logical candidate for this role appears to be nicotine. Maggio and colleagues, for example, have shown that nicotine prevents experimental Parkinsonism in rodents. Chronic nicotine infusion also improves rat memory. These effects seem to occur because nicotine augments dopaminergic neurotransmission apparently increasing dopamine levels and reducing dopamine utilization in the substantia nigra and forebrain.

In addition, Shimohama and colleagues have shown that nicotinic cholinergic receptor stimulation induces neuroprotection against glutamate cytotoxicity because it inhibits the formation of nitric oxide. If, as this author has suggested, the toxicity of glutamate is the key to the brain degeneration seen in Parkinsonism, it is hardly surprising smoking, therefore, is protective against the disease.

The purpose of this letter is not to promote smoking in an effort to reduce glutamate and hence Parkinson's disease. Nicotine, however, can be obtained in other ways. It has been shown, for example, that dermal plasters (containing nicotine) can perhaps improve short-term memory in Alzheimer's patients and may, therefore, also be an option for the treatment of Parkinsonism.

Harold D. Foster, Ph.D.
Dept. of Geography,
University of Victoria
PO Box 3050
Victoria, BC, V8W 3P5

References


