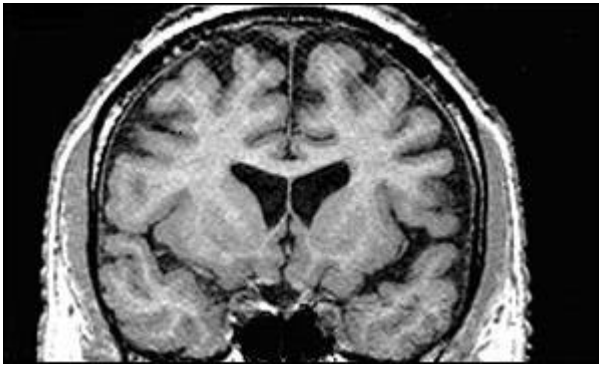


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Front Page Monday, 6 November, 2000, 00:57 GMT

## Pesticide link to Parkinson's



Parkinson's patients have changes in their brains

A commonly used organic pesticide produced symptoms similar to Parkinson's disease when small amounts were injected into rats over time.

It adds weight to theories that repeated exposure to low levels of agrochemicals may also be causing cumulative damage to the human brain.

The pesticide Rotenone, frequently used as an insecticide and as a method of killing fish, is considered relatively benign compared to many commercially available chemicals.

But scientists now believe it interferes with cells in the brain which produce a chemical called dopamine. Lack of dopamine produces the well-known Parkinsonism symptoms such as tremor, rigidity and difficulty moving.

### Age factor

The loss of key brain cells is presently irreversible, and worsens over time, eventually leading to death.

The cause of Parkinson's Disease is largely unknown, with cases appearing sporadically and apparently at random, leading some scientists to think it could be caused by long-term exposure to environmental toxins.

Because of the current lack of knowledge about the origins of the illness, the only acknowledged risk factor is age - the older you are, the more likely you are to get it.

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"The chemical doesn't seem dangerously toxic if eaten or drunk"

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Approximately 1% of people over the age of 65 develop the illness.

To test the chemical link, Dr Tim Greenamyre from the Emory University in Georgia, US, administered Rotenone intravenously over a period of weeks to rats.

### **Small numbers**

Not only did the rats develop some of the physical symptoms of Parkinson's, but scans revealed actual changes in their brains which appear similar to changes in the brain of a Parkinson's patient.

The research is published in the journal Nature Neuroscience.

The team believes Rotenone may be causing cell components called mitochondriae to release damaging molecules called free radicals, which go on to affect the dopamine-producing brain cells.

Professor Adrian Williams, chairman of the medical advisory panel of the Parkinson's Disease Society, said it was possible that pesticides did cause Parkinson's in some patients - but the likelihood was it was only a small minority.

### **Genetic susceptibility**

He said it was possible a minority of patients had a genetic make-up which made them more vulnerable to the effects of pesticides than normal.

He told BBC News Online: "It is unlikely that all cases of Parkinson's are caused by pesticides, but it may be that one or two in every hundred are.

"It would be wrong to expect that a condition such as Parkinson's is caused by a single factor."

Professor Williams also warned of the dangers of drawing conclusions based on experimental research on animals.

### **Brain changes**

Separate research, published in the journal Science, supports the theory that free-radical damage is behind the development of Parkinson's.

A team from the University of Pennsylvania School of Medicine has identified a protein which, when damaged by free radicals, could trigger the onset of Parkinson's.

When the physical brain changes associated with Parkinson's were examined, a protein, called alpha-synuclein, was found in an altered state there, but not elsewhere.

This change to the protein could have been caused by free radicals.

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