

Fast-food linked to Alzheimer's: Swedish scientists

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Mice that were fed a diet rich in fat, sugar and cholesterol for nine months developed a preliminary stage of the morbid irregularities that form in the brains of Alzheimer's patients. The study results, published in a doctoral thesis from the Swedish medical university Karolinska Institutet (KI), give some indications of how this difficult to treat disease might one day be preventable.

Alzheimer's is the most common form of dementia, there being roughly 90,000 patients with the disease in Sweden today. The underlying causes of Alzheimer's disease are still something of a mystery, but there are a number of known risk factors. The most common is a variant of a certain gene that governs the production of apolipoprotein E, one of the functions of which is to transport cholesterol. The gene variant is called apoE4 and is found in 15-20 per cent of the population.

For her doctoral thesis, Susanne Akterin studied mice that had been genetically modified to mimic the effects of apoE4 in humans. The mice were then fed for nine months on a diet rich in fat, sugar and cholesterol, representing the nutritional content of most fast food.

"On examining the brains of these mice, we found a chemical change not unlike that found in the Alzheimer brain," says Ms Akterin, postgraduate at KI Alzheimer's Disease Research Center.

The change in question was an increase in phosphate groups attached to tau, a substance that forms the neurofibrillary tangles observed in Alzheimer's patients. These tangles prevent the cells from functioning normally, which eventually leads to their death. Ms Akterin and her team also noted indications that cholesterol in food reduced levels of another brain substance, Arc, a protein involved in memory storage.

"We now suspect that a high intake of fat and cholesterol in combination with genetic factors,

such as apoE4, can adversely affect several brain substances, which can be a contributory factor in the development of Alzheimer's," says Susanne Akterin.

Previous research has shown that a phenomenon known as oxidative stress in the brain and a relatively low intake of dietary antioxidants can also increase the risk of Alzheimer's. Ms Akterin has now demonstrated in her thesis that two antioxidants are dysfunctional in the brains of Alzheimer patients, which can lead to nerve cell death.

"All in all, the results give some indication of how Alzheimer's can be prevented, but more research in this field needs to be done before proper advice can be passed on to the general public," she says.

Source: Karolinska Institutet

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