

Activated immune system attacks brain after stroke

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Research showing that the body's own natural defences can actually worsen the brain damage caused by a stroke is due to be presented at a major biomedical conference today.

The study by Dr Barry McColl, Dr Stuart Allan and Professor Dame Nancy Rothwell at The University of Manchester suggests a way in which an immune system that has already been activated by an infection elsewhere in the body can target the vulnerability of the brain following a stroke.

The team's findings, to be featured at the Life Sciences 2007 conference in Glasgow, may have important implications for the elderly, who are most at risk of stroke and frequently suffer from infection and other conditions, such as atherosclerosis, that stimulate the immune system.

Stroke - the brain equivalent of a heart attack - is the UK's third biggest killer as well as the leading cause of disability, affecting 150,000 people every year. It costs the health service £2.8billion a year in direct care costs and accounts for 6.5% of total NHS and social services expenditure. There are currently no treatments available.

"Our study suggests that if the immune system is already primed by an infection or another stimulus when stroke occurs, then the outcome of the stroke will be worse," said Dr McColl, who is based in Manchester's Faculty of Life Sciences.

"Tests on mice given a stimulus to mimic bacterial infection and activate their immune system showed they suffered more than twice the amount of cell death in the brain following a stroke compared to mice that were given a placebo.

"The findings are particularly significant because a recent study has shown that the chances of having a stroke are increased after infection. However, it will be important to confirm these results in further studies."

The group also discovered that a population of white blood cells, called neutrophils, that normally fight infection by killing bacteria, was responsible for the increased brain damage. Mice in which neutrophils were depleted did not develop as much damage.

The results - published in the Journal of Neuroscience - indicate that other conditions, like obesity and tooth decay, which trigger similar immune responses to infections, might also increase the severity of brain damage caused by stroke.

"Knowing exactly how the underlying activation status of the immune system affects stroke will help to develop new ways of combating the damage caused by stroke," said Dr McColl.

"This could have implications for the way stroke patients are treated in the future. For example, anti-inflammatory drugs that are currently being tested in human trials may be able to dampen the activated immune system and so reduce brain damage."

Source: University of Manchester

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