Behind the headlines

Your guide to the science that makes the news

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NHS Knowledge Service

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'Instant' Alzheimer's drug claim

"A drug used for arthritis can reverse the symptoms of Alzheimer's 'in minutes'", the *Daily Mail* reported. Several newspapers covered the story of how an 81-year-old man with Alzheimer's disease improved within 10 minutes of being injected with a new drug, etanercept. The BBC reported that his wife described the effect on her husband as being "put back to where he was". His son said, "This was the single most remarkable thing I've seen".

Reports of success in single patients often herald the start of a new line of investigation into diseases and drugs. Though anecdotal evidence holds promise for patients, families and researchers, most of the news reports suggest that it is too soon to say if this drug will fulfil its potential. Larger, placebo controlled studies will be required to determine if this drug is safe or effective for this disease. The drug has the advantage that it has already been approved as safe for use in humans for treating arthritis, and this could speed up the process of testing its effectiveness in treating Alzheimer's.

Etanercept is already approved for treating arthritis

Where did the story come from?

Dr Edward Tobnick from the Institute of Neurological Research and Dr Hyman Gross from the USC School of Medicine in Los Angeles carried out this research. The institute is a private medical group and there was no funding from outside sources. Competing interests were declared.

The study was published online in the *Journal of Neuroinflammation.*

What kind of scientific study was this?

This was a case study (a study in one person) that tested the short-term effects of the drug etanercept on a patient with Alzheimer's disease.

The researchers first obtained the written consent of the patient and his wife and explained the potential risks of the drug, which included infection and death. They then conducted a routine examination of the 81-year-old retired doctor followed by a range of tests for memory, attention and mathematical ability. The Montreal Cognitive Assessment (which assesses mild cognitive dysfunction) was used to give a numerical score for the degree of dementia. Prior to the injection the score was seven out of a possible 30 points, a number consistent with moderate to severe dementia.

The drug was then injected around the spinal cord at neck level, and the patient was placed with his head downwards, so that the drug would run to the head. The patient was re-examined after a 10 minute and two hour interval.

The drug etanercept belongs to a class of drugs called TNF-alpha blockers. These are increasingly used for the treatment of severe rheumatoid arthritis and other conditions caused by inflammation. This type of drug is usually administered by injection into muscle. It acts by deactivating a chemical involved in the early stages of generalised inflammation and in regulating immune cells - tumour necrosis factor (TNF). The researchers had already conducted a study that measured the drug's longer-term effects in 15 patients over a six month period and this study was aimed at assessing the rapid effects of the drug.

What were the results of the study?

Ten minutes after the injection, the researchers reported that the patient was calmer, less frustrated and more attentive. He could correctly identify California as his home state, but incorrectly identified the current year. At two hours, the Montreal Cognitive Assessment had improved from seven out of a possible 30 to 15. The man's wife and son confirmed the improvements.

What interpretations did the researchers draw from these results?

In their discussion of the results, the researchers describe the biological mechanisms providing the rationale for trying out this drug. They suggest it is a promising area for additional investigation and therapeutic intervention.

What does the NHS Knowledge Service make of this study?

As a case report of a single patient, this study represents very early evidence in the long journey from drug development to clinical use in patients. Disadvantages to this type of study include:

- the lack of any control patients against which the effect can be compared, meaning that it may be that some of the improvements, for example the lessened anxiety, could have occurred by sitting in the doctors office for long enough without being given any medication
- the lack of long term follow up means that it is not possible to know how long any suggested improvement may last
- the lack of results from other patients mean the effect may not be seen in other people

The drug has an advantage in that it is already approved for use in other conditions and therefore something is already known of its safety. The long and short term effects of drugs can be markedly different and this study may stimulate further research into the short term effects of etanercept for dementia.

While providing hope for those who suffer from Alzheimer's and their families, this case study should be regarded as a preliminary finding of this drug's use as a treatment for the disease. Further controlled studies of the drug's effects in a larger group of people would be required to test the drug's effectiveness properly.

Links to the headlines

Arthritis drug offers hope to ease dementia. The Times, January 10 2008

UCLA drug aids Alzheimer's patient 'in minutes'. The Daily Telegraph, January 10 2008

Dementia drug instant hit claim. BBC News, January 10 2008

Drugs to ease arthritis can reverse the symptoms of Alzheimer's. Evening Standard, January 10 2008

Links to the science

Tobinick EL, Gross H. Rapid cognitive improvement in Alzheimer's disease following perispinal etanercept administration. *J Neuroinflammation* 2008; 5:2

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