Brain Disorders/Neurological

Schizophrenia due to a 'Retrovirus'

BBC - April 2001: A virus which hijacks part of the human genetic code may have some link to the mental illness schizophrenia.

The retrovirus may have invaded human DNA millions of years ago and been carried down through generations, say scientists.

The experts believe that some activity from the retrovirus may have some unknown effect on the brain, perhaps contributing to a number of cases of schizophrenia.

A study by a team from the Johns Hopkins School of Medicine in Baltimore tested both diagnosed schizophrenics, and healthy volunteers for traces of the retrovirus.

They found an "unexpectedly" high level of the retroviral traces in cerebrospinal fluid taken from the schizophrenics, compared to very little in the other study subjects.

The findings were reported in the journal, the Proceedings of the National Academy of Sciences.

But the authors warned that it did not represent the complete answer to the genesis of schizophrenia.

Tiny invaders

Viruses, much smaller than bacteria, are bundles of genetic material wrapped in a protein skin.

Some viruses, such as influenza, can invade human cells, reproduce inside them and then burst out to infect other cells.

However, retroviruses work in a different, subtler, way.

They are made of a type of genetic material called RNA, and can produce DNA which integrates with the genetic information contained in the cell itself.

It can then instruct the cell to produce more copies of itself which again can burst out and infect more cells.

However, these modified cells - and the viral genetic code they contain, will die when the host dies, unless other organisms can be infected.

HIV, the virus which leads to Aids in humans, is an example of this sort of retrovirus.

However, other retroviruses, called endogenous retroviruses, perpetuate themselves by mixing their code with the cells that are part of the "germ line".
**Code passed on**

It can then be passed down to offspring, be present in every cell in their body, then proceed onwards down through the generations.

Through mutations, most of these retroviruses become inactivated over this huge period, although a few retain - or regain - some form of activity, and can produce the RNA which has been detected by these experiments.

The scientists found the distinct RNA signature of an endogenous retrovirus called HERV-W in the DNA of 29% of schizophrenia patients with the acute form the disease, and 7% of those with the chronic form.

Dr Robert Yolken, from Johns Hopkins, said: "While a low level of retrovirus expression occurs in most human tissues, we found an unexpectedly high level of expression in the cerebrospinal fluids of individuals who'd had a recent onset of schizophrenia."

"While our report doesn't explain why the retrovirus becomes active in the first place, it presents clues as to what may happen when it does become active.

"Our ultimate hope is that we can interfere with the retrovirus by preventing it from becoming active. If we can do that, it may give doctors another method of treating schizophrenia."

A spokesman for the National Schizophrenia Fellowship said that the finding should not be interpreted as a "definitive" analysis of the cause of schizophrenia.

"Schizophrenia remains poorly understood, but is almost certainly an umbrella term covering a range of conditions with a number of common symptoms."

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