The brains of people with schizophrenia are on 'red alert', study finds

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New Australian research shows that the brains of people with schizophrenia may be under attack by the immune system, providing the strongest evidence to date of a link between immune function and schizophrenia.

In 40% of people with schizophrenia, increased inflammation was found in a part of the brain called the dorsolateral prefrontal cortex, a key brain region affected by schizophrenia.

“To find this immune pattern in nearly half of people with schizophrenia raises the possibility that this is in fact a new root cause of the disease,” says senior author of the study, Prof Cyndi Shannon Weickert from Neuroscience Research Australia.

Prof Shannon Weickert, Stuart Fillman and colleagues used new genetic tools to directly measure immune activity in the brains of people with schizophrenia and healthy people without the disease.

“The part of the brain we looked at is indeed ‘in crisis’ in people with schizophrenia. From the types of immune markers we measured it’s like the brain is on red alert,” says Prof Shannon Weickert.

Recent research has tended to focus on a link between early infections and the incidence of schizophrenia.

“Unlike previous studies, we have directly measured immune activity in parts of the brain known to be affected by schizophrenia,” says Prof Shannon Weickert.

Overactivity of the immune system in the brains of people with schizophrenia means that future therapies for schizophrenia aimed at immune suppression will now be investigated.

“As there are multiple biological root causes of schizophrenia, the fact inflammation occurs in 40% of individuals is huge, and opens up a whole new range of treatment possibilities” Prof Shannon Weickert concluded.

The paper is published in the journal *Molecular Psychiatry*.

How was this study done?

- Brain tissue from the dorsolateral prefontal cortex from 37 people with schizophrenia and 37 healthy controls was used in this study.
- SOLiD Next Generation Sequencing was used to look for

changes in gene expression, particularly genes involved in immune function.

- Increased levels of pro-inflammatory cytokines were found in 40% of people with schizophrenia. Cytokines are proteins involved in cell-to-cell communication; pro-inflammatory cytokines drive immune responses, including the activation of microglia.

Provided by Neuroscience Research Australia