World first study reveals antibodies that may trigger psychosis in children

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A world first study revealing the presence of two antibodies in a sub-group of children experiencing their first episode of psychosis affirms a longstanding recognition that auto-immune disorders play a significant role in psychiatric illness.

Antibodies defend the body against bacterial, viral, and other invaders but sometimes the body makes antibodies that attack healthy cells. In these cases, autoimmune disorders develop. These include conditions such as multiple sclerosis (MS), rheumatoid arthritis and Type 1 diabetes.

This 'immune hypothesis' is supported by new work colleagues in the current issue of *Biological Psychiatry*

Researchers from the Kids Research Institute at the Children's Hospital, Westmead, and the University of Sydney detected antibodies to the dopamine D2 receptor or the N-methyl-D-aspartate (NMDA) glutamate receptor among eight out of 43 children experiencing their first episode of psychosis, but no such antibodies in healthy children.

Both are key neural signaling proteins previously been implicated in psychosis.

"The antibodies we have detected in children having a first episode of acute psychosis suggest there is a distinct subgroup for whom autoimmunity plays a role in their illness," says the University of Sydney's Dr Fabienne Brilot, the senior author on the paper and Head of the Neuroimmunology Group at The Children's Hospital at Westmead in Sydney.

"The finding suggests that better interventions are possible, providing hope that major disability can be prevented for the subset of children experiencing acute psychosis with antibodies," Brilot adds.

Dopamine is a chemical messenger aiding the transmission of signals in the brain and other areas of the body. Regulating its actions plays a crucial role in mental and physical health.

Dopamine acts on receptors tailored specifically for it. The dopamine-2 receptor (D2R) is one of five subtypes of mammalian dopamine. Increasing knowledge of the roles of dopamine receptor subtypes raises the hope that more selective drugs will be developed.

Abnormalities in dopaminergic neurotransmission play a key role in the pathogenesis of psychosis. Many drugs affect dopamine transmission directly by either blocking or stimulating its receptors.

Many antipsychotics show varying affinities for the different dopamine receptors but blockade of the dopamine-2 receptor (D2R) specifically has proved to be indispensable in the clinical management of psychosis.

While less well established than dopamine, it is also likely that glutamatergic dysfunction also plays a role in psychotic disease.

This suggests that specific pathologies and processes affecting D2R and the glutamatergic N-methyl-D-aspartate receptor (NMDAR) could define biological subgroups and may be involved in the pathogenesis of psychosis and other psychiatric illnesses such as schizophrenia.

"There is a pressing need in psychiatry to establish biologically based disease subtypes, which might allow for more specific diagnosis and effective intervention," says Dr Brilot.

"Our findings contribute further understanding of the biology of psychiatric and neurological diseases and whether autoantibodies detected in a subgroup of patients can trigger psychiatric disorders.

"Further research will reveal whether these antibodies are the mark of a clinically relevant subset of patients and, if so, whether immunosuppressive therapies can effectively treat children with these debilitating illnesses."

Provided by University of Sydney