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Genes of the immune system are associated with increased risk of mental illness

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Genes linked to the immune system can affect healthy people's personality traits as well as the risk of developing mental illness and suicidal behaviour, reveals a thesis from the University of Gothenburg, Sweden.

Inflammation is part of the immune system and is responsible for defending humans against infection as well as fascilitating the healing of injuries, and is therefore vital for our survival. Research has demonstrated that inflammatory processes also have other roles to play as inflammatory substances produced by the body influence mechanisms in the brain involving learning and memory.

Inflammatory substances produced in moderate quantities in the brain can be beneficial during the formation of new brain cells, for example. However, an increase in the levels of these substances as is the case during illness, can result in damage to the brain.

"Previous studies have shown that individuals suffering from various mental illnesses have an increased peripheral inflammation, but the reason behind this increase is not known," says Petra Suchankova Karlsson, who wrote the thesis. "It has been suggested that the stress that goes with mental illness activates the body's immune system, but it is also possible that inflammation in the body affects the brain, which in turn results in mental illness."

Previous studies have focused on how environmental and psychological

factors affect the immune system's impact on the brain. Suchankova's thesis presents, for the first time, results that suggest that several different genes linked to the immune system are associated with healthy people's personality traits. It also demonstrates that some of these genes are associated with an increased risk of developing schizophrenia or suicidal behaviour.

"One of the things we studied was a gene variant that increases impulsiveness in people who carry it," says Suchankova. "We already knew that the risk of attempting suicide is higher in impulsive people and therefore analysed this gene variant in a group of patients who had attempted to take their life. We found that these patients more often carried the particular gene variant when compared to the general population which meant that this variant was not only associated with increased impulsiveness in healthy individuals but also with increased risk of suicidal behaviour."

The change in the levels of inflammatory substances in the blood of patients suffering from a mental illness as previously noted may have been caused by inflammation-related genes affecting the risk of mental illness, rather than the illness itself leading to a change in levels, as is traditionally believed.

"It could well be that some variants of the genes play a role in the development of mental illness by controlling how the brain is formed, perhaps during the embryonic stage, or by affecting the transfer of signal substances," says Suchankova.

The results of this thesis support the proposed role of the immune system in mental illness, and could be used as a basis for further studies that, it is hoped, will lead to the development of new treatment methods.

The thesis has been successfully defended.

Provided by University of Gothenburg