

Study links brain inflammation to suicidal thinking in depression

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Credit: George Hodan/Public Domain

Patients with major depressive disorder (MDD) have increased brain levels of a marker of microglial activation, a sign of inflammation, according to a new study in *Biological Psychiatry* by researchers at the University of Manchester, United Kingdom. In the study, Dr. Peter Talbot and colleagues found that the increase in the inflammatory marker was present specifically in patients with MDD who were

experiencing suicidal thoughts, pinning the role of inflammation to suicidality rather than a diagnosis of MDD itself.

"Our findings are the first results in living [depressed patients](#) to suggest that this microglial activation is most prominent in those with suicidal thinking," said Dr. Talbot. Previous studies suggesting this link have relied on brain tissue collected from patients after death.

"This paper is an important addition to the view that inflammation is a feature of the neurobiology of a subgroup of depressed patients, in this case the group with suicidal ideation," said Dr. John Krystal, Editor of Biological Psychiatry. "This observation is particularly important in light of recent evidence supporting a personalized medicine approach to depression, i.e., that anti-inflammatory drugs may have antidepressant effects that are limited to patients with demonstrable inflammation."

In the study, first author Dr. Sophie Holmes and colleagues assessed inflammation in 14 patients with moderate-to-severe depression who were not currently taking any antidepressant medications. Immune cells called microglia activate as part of the body's inflammatory response, so the researchers used a brain imaging technique to measure a substance that increases in activated microglia.

The evidence for immune activation was most prominent in the [anterior cingulate cortex](#), a brain region involved in mood regulation and implicated in the biological origin of depression, confirming the results of a previous study that first identified altered microglial activation in medication-free MDD patients. Smaller increases were also found in the insula and prefrontal cortex.

"The field now has two independent reports—our study and a 2015 report by Setiawan and colleagues in Toronto—showing essentially the same thing: that there is evidence for [inflammation](#), more specifically

microglial activation, in the brains of living patients during a major depressive episode," said Dr. Talbot.

This link suggests that among depressed patients, neuroinflammation may be a factor contributing to the risk for [suicidal thoughts](#) or behavior. According to Dr. Talbot, the findings "emphasise the importance of further research into the question of whether novel treatments that reduce microglial activation may be effective in major depression and suicidality."

More information: Sophie E. Holmes et al, Elevated Translocator Protein in Anterior Cingulate in Major Depression and a Role for Inflammation in Suicidal Thinking: A Positron Emission Tomography Study, *Biological Psychiatry* (2017). [DOI: 10.1016/j.biopsych.2017.08.005](#)

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