Antibiotic may improve outcomes for depression in people with low level inflammation

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King's College London researchers have found evidence that minocycline, a widely used antibiotic with anti-inflammatory properties,

gave greater improvement in depressive symptoms in patients with treatment resistant depression with low-grade peripheral inflammation.

Improvement in depressive symptoms In a four-week randomised clinical MINDEP (MINocycline in DEPression) trial, 39 patients with major depressive disorder were recruited from services linked to South London and Maudsley NHS Foundation Trust (SLaM) and via public advertisement.

The trial took place at the NIHR / Wellcome Trust King's Clinical Research Facility at King's College Hospital. The patients, who were taking their routine antidepressant treatment, were split into two groups, one group took daily a placebo (sugar pill) tablet while the other group took daily minocycline alongside their routine treatment for 4 weeks. Both groups showed similar, significant improvement in depressive symptoms as measured by the Hamilton Depression (HAM-D) Rating Scale. However, patients with higher C-reactive protein (CRP) levels, indicating low-grade inflammation, showed greater improvement in their depressive symptoms when taking minocycline.

Author Dr. Valeria Mondelli, Clinical Reader in Psychoneuroimmunology at Institute of Psychiatry, Psychology & Neuroscience, King's College London, and Principal Investigator of the trial said: "Our findings are very exciting because we are showing that patients with increased levels of C reactive protein (an inflammatory biomarker) show a good response in terms of reduction of depressive symptoms following treatment with minocycline. Of the many patients with depression who do not respond to usual antidepressant treatment, we have shown in previous studies that in at least two thirds of patients this could be due to the increased levels of inflammation. Now, with this study, we are identifying a potential new effective treatment for these patients."

Predicting responsePatients underwent a blood sample to measure biological markers and a clinical assessment at the baseline visit and within 14 days the trial ending.

Researchers also found that levels of two biological markers, CRP and IL-6, can be used to predict minocycline response in depression. The study identified a specific threshold of CRP levels which is associated with the antidepressant effect of minocycline treatment. Another inflammatory marker, interferon-gamma, was reduced by the treatment with minocycline but not by placebo, suggesting specific pathways mediating the effects of minocycline on depressive symptoms.

Dr. Mondelli added "We also identified the threshold of CRP levels that is associated with response to this anti-inflammatory treatment. This is very important as we may be able to identify with an easy blood test those patients who are going to benefit from treatment with an anti-inflammatory medication which is already used for other medical conditions and therefore easily available."

Dr. Maria Antonietta Nettis, lead author and Clinical Research Associate at Institute of Psychiatry, Psychology & Neuroscience, King's College London said: "Integrating the measurement of biological markers such as CRP in patients' first assessments could help identifying potential responders to minocycline, which could be a relatively safe and well-tolerated addition to treatment in immune-related depression.

Although replications in larger samples are needed, we believe our study has a potentially important clinical impact, as we moved a step towards the identification of personalized treatments for Major depressive disorder (MDD)."

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