

Inflammation may influence weight loss surgery outcomes, new study reveals

August 31 2023



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New research shows that higher levels of inflammation in the blood of patients with obesity undergoing bariatric surgery predicts poorer weight loss six months after the procedure.

Published in *Psychological Medicine* and led by researchers from the Institute of Psychiatry, Psychology & Neuroscience (IoPPN), King's College London, this is the first study to investigate the links between depression and [inflammation](#) in patients with obesity before and after bariatric [surgery](#).

The analysis showed a [strong relationship](#) between depression and inflammation in [obese patients](#) before and after surgery, and it indicated that it was increased inflammation rather than depression that was driving poor weight loss after bariatric surgery.

Lead author and Clinical Professor of Psychoneuroimmunology at IoPPN, King's College London, Valeria Mondelli, said, "Our study has important clinical implications as it identifies specific targets for future personalized interventions which could improve physical and mental health outcomes after bariatric surgery. For example, our data showing that increased inflammation predicts lower weight-loss after bariatric surgery suggests that personalized treatments involving approaches that lower inflammation could enable better outcomes after surgery."

Obesity costs the NHS around £6 billion a year, and this figure is predicted to rise to £9.6 billion per year by 2050. Bariatric surgery physically alters the stomach and/or the bowel to reduce the amount of food people can eat and to reduce the absorption of nutrients.

Obese patients can lose up to 70% of excess weight after surgery, but there is variation in the outcomes. To help patients with obesity and ensure costly treatments are as effective as possible (private bariatric surgery can cost £4,000 to £10,000), it is important to understand the factors that can influence surgery.

Depression and obesity are known to often occur together, and previous research suggests the release of inflammatory proteins as part of the

immune response may be a shared disease mechanism that is driving both conditions. To improve the understanding of this relationship and its potential role in obesity and bariatric surgery outcomes, the study investigated the differences in proteins released in the body during inflammation between obese patients with and without depression undergoing surgery.

The 85 participants in the study, enrolled from King's College Hospital NHS Foundation Trust in south London, were all obese (BMI >35) and part of the ongoing Bariatric Surgery & Depression study. Levels of proteins released during inflammation, such as C-Reactive Protein (CRP), and cytokines, such as interleukin-6 (IL-6) and interleukin-4 (IL-4), were measured before and after surgery in participants' blood and tissue.

Before surgery, 41 participants had symptoms of depression that reached the threshold of a clinical diagnosis, while in the remaining 44 participants, the symptoms of depression were below this threshold. The study showed that those with depression had higher levels of the inflammatory proteins CRP and IL-6 in the blood and lower levels of the anti-inflammatory protein IL-4. They also had higher levels of one inflammatory protein in their adipose tissue.

Six months after surgery, the bariatric patients who had depression before surgery continued to have higher levels of IL-6 and CRP in the blood, despite no difference in weight loss between those with and without depression.

Overall, bariatric surgery led to weight loss in all patients in line with what was expected, and the majority of patients who previously had depression before surgery also experienced a reduction in their symptoms so that they were no longer considered clinically depressed. Out of 44 patients who had depression before surgery, 29 completed the

six-month follow-up, and only about one-third (34.5%;10 patients) of those still had [clinical depression](#) after surgery.

Researchers analyzed whether measures of inflammation and depression before surgery might be able to predict weight loss and depression after surgery. This showed that higher levels of CRP predicted reduced weight loss at six-month follow-up. However, levels of CRP in the blood before surgery did not predict levels of depression afterwards; instead, this was predicted by depression before surgery and experience of childhood trauma.

First author Dr. Anna McLaughlin, Postdoctoral Research Associate at IoPPN, King's College London, said, "Our study is the first to show that inflammation levels in the blood, rather than [depression](#), play a significant role in weight loss outcomes after [bariatric surgery](#). Additionally, our research aligns with previous findings, emphasizing that patients with childhood trauma may benefit from more psychological support after surgery. As we move forward, combining inflammation data with clinical insights will be crucial to pinpointing risk factors and improving outcomes for bariatric patients."

More information: Peripheral inflammation associated with depression and reduced weight loss: a longitudinal study of bariatric patients, *Psychological Medicine* (2023). [DOI: 10.1017/S0033291723002283](#)

Provided by King's College London

Citation: Inflammation may influence weight loss surgery outcomes, new study reveals (2023, August 31) retrieved 2 May 2024 from <https://medicalxpress.com/news/2023-08-inflammation-weight-loss-surgery-outcomes.html>

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