

OBESITY
BILE ACIDS AND
BARIATRIC SURGERY

Alterations in bile acid levels in obese rats by a bile diversion procedure replicate key metabolic improvements observed after bariatric surgery, new data reveal.

Bariatric surgery results in weight loss, improved metabolic regulation and reduced mortality in individuals with morbid obesity. However, the mechanisms related to the metabolic benefits of bariatric surgery are not fully explained by weight loss alone. Bile acids might have a role, as bariatric surgery elevates serum levels of bile acids and seems to increase bile acid metabolic signalling pathways. Kohli *et al.* hypothesized that a bile diversion procedure in obese rats would recapitulate the metabolic outcomes of bariatric surgery.

“We surgically placed a polyethylene catheter proximally into the common bile duct to divert bile in to the distal jejunum,” explains lead researcher Rohit Kohli of the Cincinnati Children’s Hospital Medical Centre. “This catheter placement approach allowed us to directly study in isolation the effect of bile acids on metabolic parameters, without altering the anatomy of the intestinal tract.”

Male rats with diet-induced obesity were randomly allocated to undergo the bile diversion procedure, sham surgery (in which the bile duct was dissected) or no surgery. The researchers studied the metabolic effects of the bile diversion procedure, compared with the sham surgery or no surgery, for up to 5 weeks, during which time the rats were fed a high-fat diet. Rats with the bile diversion procedure had elevated serum levels of bile acids. This group of rats also had increased weight loss, reduced fat mass, improved glucose tolerance and an increased glucagon-like peptide 1 response. Rats with the bile diversion also had decreased levels of liver steatosis, which were accompanied by reduced markers of endoplasmic reticulum stress.

The findings hint at novel ways to treat obesity. “We hope to use this model to target specific bile-acid-driven signalling pathways to study potential therapeutic measures that may be called ‘bariatric mimetics’ or agents that can produce the effect of the surgeries without patients having to undergo surgery itself,” says Kohli.

Carol Wilson

Original article Kohli, R. *et al.* A surgical model in male obese rats uncovers protective effects of bile acids post-bariatric surgery. *Endocrinology* doi:10.1210/en.2012-2069