



BSIP/Contributor

 GUT MICROBIOTA

Antibiotics do not affect metabolism in obesity



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Evidence from rodent studies suggest that modulating the gut microbiota can improve metabolic disorders and might be a potential therapy for obesity and related complications in humans. However, in new data from a randomized controlled trial, antibiotic treatment did not improve metabolic outcomes in men with obesity.

The team recruited 57 men aged 35–70 years, who were prediabetic with overweight or obesity (BMI >31 kg/m²). The participants were then randomly assigned to receive either placebo, the broad-spectrum antibiotic amoxicillin or a narrow-spectrum antibiotic, vancomycin, for 7 days. The patients were assessed for any changes in microbiota composition and improvement in metabolic parameters immediately after the treatment and at 8-weeks follow-up.

The treatment with placebo and amoxicillin did not significantly alter the composition of

the microbiota. Vancomycin, meanwhile, significantly reduced microbial diversity, which was still apparent at 8 weeks follow-up. However, compared with placebo, neither amoxicillin nor vancomycin had any effect on insulin sensitivity in peripheral tissues, or specifically in liver, skeletal muscle or adipose tissue. Energy expenditure and substrate metabolism were also unaltered by antibiotic treatment, as were gut permeability and plasma levels of inflammatory markers.

“Our findings imply that interfering with a resilient adult microbiota by antibiotics has no clinically relevant short-term and long-term effects on several metabolic parameters,” says study author Gijs Goossens.

Vancomycin treatment did reduce bile acid and short-chain fatty acid concentrations, which has been reported to affect energy metabolism and incretin release in

rodents; but these effects were not seen in the patients in this study. Vancomycin treatment also increased expression of genes in adipose tissue that might regulate oxidative metabolism, but no changes in adipocyte morphology or levels of circulating free fatty acids, triacylglycerol or leptin were identified.

“We cannot exclude that a more prolonged or more frequent perturbation of gut microbiota composition may have clinically relevant effects on metabolic health,” clarifies Goossens, who adds that, “future prospective and long-term (dietary) intervention studies should be performed to elucidate whether the gut microbiota significantly contributes to host physiology in humans.”

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ORIGINAL ARTICLE Reijnders, D. et al. Effects of gut microbiota manipulation by antibiotics on host metabolism in obese humans: a randomized double-blind placebo-controlled trial. *Cell Metab.* **24**, 63–74 (2016)