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OBESITY

Obesity alters fatty acid sensing

A growing body of evidence suggests that the capacity of the intestine to sense fatty acids is compromised in obesity. In new research, investigators have found that the intestinal expression of genes that encode three free fatty acid sensors, *FFAR1*, *FFAR4* and *CD36*, are significantly altered in humans with obesity.

The investigators, recruited individuals who were lean, overweight or with obesity and took biopsy samples from the duodenum before and after a 30-minute infusion of lipids.

At baseline, expression of both *FFAR1* and *FFAR4* was 62% lower in participants with obesity than in lean counterparts. In participants with obesity, expression of *CD36* was 242-fold and 202-fold higher than in lean or overweight individuals, respectively. Baseline expression of *GPR119*, localised to enteroendocrine cells, was the same in all participants. However, after an infusion of a commercially available 10% lipid emulsion directly into the duodenum, expression of *FFAR1* and *GPR119* was increased, whereas the expression of *CD36* and *FFAR4* was unchanged.

Moreover, expression of *FFAR1* and *FFAR4* was negatively associated, and that of *CD36* positively associated, with increasing BMI in participants. *GPR119* expression was unrelated to BMI. Finally, as food intake is associated with increased secretion of hormones from gastrointestinal cells, the team also looked at secretion of glucose-dependent insulinotropic polypeptide (GIP) in response to lipid intake. Of the four fatty acid sensors, only the lipid-induced increase in *FFAR1* expression correlated with plasma levels of GIP.

The findings highlight that elevated BMI alters the expression of genes that are involved in the capacity to sense and absorb dietary lipids, which might, therefore, further promote the development of obesity.

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ORIGINAL ARTICLE Cvijanovic, N. *et al.* Lipid stimulation of fatty acid sensors in the human duodenum: relationship with gastrointestinal hormones, BMI and diet. *Int. J. Obesity* http://dx.doi.org/10.1038/ijo.2016.199 (2016)