

Incretin response to a standard test meal in a rat model of sleeve gastrectomy with diet-induced obesity

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Introduction: Currently the most effective treatment for obesity is bariatric surgery. Surgery that includes gastro-duodenal bypass not only produces sustained weight loss but also improves glycemic control and insulin sensitivity. Previous studies have shown that sleeve gastrectomy (SG) produces similar results and implicate the incretin hormones.

Methods: Male Sprague Dawley rats were divided into four groups; lean control (Lean), diet-induced obese (DIO), DIO animals that had undergone SG and DIO animals that had been sham-operated (Sham). After a 2 week recovery period, an oral glucose tolerance test (OGTT) was performed and the incretin response to a standard test meal measured. Blood sampling was performed in free moving rats at various time points through chronic vascular access to the right jugular vein.

Results: There was a significant increase in the bodyweight of animals fed with a high-fat, high-sugar diet compared to lean which was reversed by SG. DIO caused in an impairment of the GLP-1 but not GIP response to a standard test meal. SG resulted in a dramatic increase in the GLP-1 response to a standard test meal but had no effect on the GIP response. A rapid rise in blood sugar was observed in the SG group following a standard test meal that was followed by reactive hypoglycemia.

Conclusions: SG dramatically increases the GLP-1 response to standard test meal, this may contribute to the resolution of diabetes observed in human subjects who undergone SG.

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