

Cause for exaggerated insulin response in subset of bariatric surgery patients identified

March 27 2014

University of Cincinnati (UC) researchers have discovered that altered islet cell function and reduced insulin clearance contribute to excessive post-meal insulin response in patients experiencing low blood sugar symptoms (hypoglycemia) following gastric bypass surgery.

These findings, led by Marzieh Salehi, MD, associate professor in the UC division of endocrinology, metabolism and diabetes, are featured online this month in *The Journal of Clinical Endocrinology & Metabolism*, and are part of an ongoing effort by UC researchers to better understand the effect of gastric [bypass surgery](#) on glucose metabolism and islet function.

Gastric bypass surgery has been shown to be one of the most effective treatments for obesity, and often improves Type 2 diabetes immediately after surgery and long before any weight loss has occurred—a phenomenon that's been attributed to earlier and larger [insulin](#) response to meal ingestion.

"For the majority of patients with [diabetes](#), gastric bypass surgery leads to improved glucose control, but a subset of patients develop post-meal hypoglycemia—associated with too much of an insulin response—several years after surgery," says Salehi, also a physician with UC Health.

For this study Salehi and colleagues enrolled 65 subjects who had gastric bypass surgery at least two years prior to enrollment. Participants were

stratified based on post-meal symptoms of low blood sugar and studied during meal tolerance tests.

"We have shown that meal ingestion after gastric bypass surgery causes an earlier and larger peak of insulin secretion, and this effect is exaggerated in those with hypoglycemic symptoms following meals," says Salehi, who adds that the effect is particularly exaggerated in those with neuroglycopenic symptoms (cognitive abnormalities, loss of consciousness, and seizure) rather than autonomic symptoms (fast heart beats, sweating, tingling, fatigue).

According to Salehi and team, this is the largest group of [gastric bypass](#) patients with post-meal symptoms of [low blood sugar](#) to be reported to date; and among this group, abnormalities in insulin clearance as well as excessive insulin secretion during glucose drops (hyperinsulinemia) were identified.

"These abnormalities contributed to elevated insulin response and lower glucose levels in these individuals," says Salehi.

Moreover, Salehi says, findings from this study suggest that in addition to excessive insulin secretion, glucagon response to hypoglycemia is abnormal. Glucagon is another important hormone in glucose regulation. It is secreted from specific cells in the pancreas in response to low glucose.

This study, the authors says, offers a better understanding of mechanisms by which [gastric bypass surgery](#) alters glucose [metabolism](#) in general, and more specifically in those individuals suffering from hyperinsulinemic [hypoglycemia](#) syndrome.

At this point, Salehi adds, there is no specific therapeutic option available for patients with this condition beyond dietary modification;

however, we expect that the future studies based on current findings will inform the development of medical and dietary interventions for treatment of this condition.

Provided by University of Cincinnati Academic Health Center

Citation: Cause for exaggerated insulin response in subset of bariatric surgery patients identified (2014, March 27) retrieved 2 May 2024 from <https://medicalxpress.com/news/2014-03-exaggerated-insulin-response-subset-bariatric.html>

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