

People without diabetes who have undergone weight loss surgery can sometimes experience low blood sugar (glucose) levels a few hours after eating a meal high in carbohydrates (like sugars and starches). This condition is called post-bariatric hypoglycaemia. It happens because, after surgery, food can move too quickly from the stomach to the intestines, causing carbohydrates to be absorbed too fast. As a result, the body releases too much insulin, a hormone that helps manage blood sugar levels and this leads to a sudden drop in blood sugar levels few hours later.

Symptoms of post-bariatric hypoglycaemia can include dizziness, sweating, shaking, hunger, and drowsiness. Current treatments are limited and may include following long-term a low in carbohydrates diet, or even reversing the surgery in more serious cases. There are limited medical treatments for this condition which are not always well tolerated. Because of the lack of effective treatments, more research is needed to find better solutions.

Previous studies in people who have not undergone weight loss surgery have shown that a fat-rich snack (without carbohydrates) thirty minutes before ingestion of a meal rich in carbohydrates delays the gastric emptying and the post-meal insulin secretion in people with and without diabetes. If this is the case also after sleeve gastrectomy, then a fat-rich snack could be a treatment option for post-bariatric hypoglycaemia after this operation.

In this study, we assessed the impact of 28g of brazil nuts (a fat-rich snack without carbohydrates) thirty minutes before a carbohydrate-rich milkshake on blood sugar levels, insulin and hormonal levels in 10 adults without diabetes who had undergone sleeve gastrectomy at least one year before the study. None of the participants had been diagnosed with post-bariatric hypoglycaemia.

Participants received two different treatments in random order:

- Group One: Participants had a fat-rich snack without carbohydrates (brazil nuts) 30 minutes before a carbohydrate-rich meal (milkshake) for the first treatment, followed by ingestion of water 30 minutes before a carbohydrate-rich meal (milkshake) for the second treatment.
- Group Two: Participants had ingestion of water 30 minutes before a carbohydrate-rich meal (milkshake) for the first treatment, followed by a fat-rich snack without carbohydrates (brazil nuts) 30 minutes before a carbohydrate-rich meal for the second treatment.

Blood sugar, insulin, and other hormones secreted from the gut and affecting glucose levels were measured before the brazil nuts/water, 15 minutes before and immediately before the carbohydrate rich meal as well as for three hours after the carbohydrate-rich meal to assess whether a fat-rich snack without carbohydrates made a difference in these parameters.

### Study Findings

The fat-rich snack (brazil nuts) 30 minutes before the milkshake did not affect the lowest glucose levels after the milkshake compared to having water. Moreover, the peak insulin levels were higher during the milkshake test with the fat-rich snack compared to having water. Pre-meal insulin, c-peptide and GLP-1 concentrations were also higher with the fat-rich snack compared to water.

In summary, a fat-rich snack before a meal rich in carbohydrates (milkshake) did not affect the lowest glucose levels in people without history of post-bariatric hypoglycaemia who have had sleeve gastrectomy. More research is needed to see if a fat-rich snack could be helpful for those with established post-bariatric surgery hypoglycaemia.