Study shows bariatric surgery's impact on diabetic kidney disease in severely obese teens

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Diabetic kidney disease is the leading cause of kidney failure in the nation, and its occurrence in youth with type 2 diabetestype 2 diabetes is rapidly rising. Medical treatments are only partially effective. However, in a new study published online in *Diabetes Care*, researchers at Children's Hospital Colorado (Children's Colorado) have found that severely obese teens with type 2 diabetes experienced a dramatic decrease in the rate of diabetic kidney disease, among other benefits, after bariatric surgery when compared to those who received medical treatment alone.

"Diabetic kidney disease is increasing in prevalence each year as more and more people develop type 2 diabetes. Furthermore, youth-onset type 2 diabetes is much more aggressive than adult-onset type 2 diabetes, meaning adolescent patients have significantly higher rates of complications like diabetic kidney disease," said Petter Bjornstad, MD, an endocrinologist at Children's Colorado and lead author of the study. "Our current treatment options for these patients are suboptimal, and novel therapies are needed. With this study, we've been able to demonstrate for the first time that surgical treatment substantially lowers the odds of diabetic kidney disease for severely obese youth with type 2 diabetes compared to medical therapy."

In the study, Bjornstad and colleagues compared diabetic kidney disease rates among two cohorts of patients over a period of five years. The patients were participants in one of two multi-center studies led by researchers at Children's Colorado: Teen-Longitudinal Assessment of Bariatric Surgery (Teen-LABS) and Treatment Options of Type 2 Diabetes in Adolescents and Youth (TODAY). Specifically, the two groups included:

- 63 TODAY participants, all of whom had received medical treatment for type 2 diabetes
- 30 Teen-LABS participants, all of whom underwent bariatric surgery and had type 2 diabetes at the time of surgery

Major findings of the five-year outcomes study included:

- The Teen-LABS study saw a 3% decrease in hyperfiltration over five years in participating adolescents, whereas TODAY participants saw a 41% increase. (With hyperfiltration, an early marker of diabetic kidney disease, the kidneys filter the blood at an abnormally high rate. Over time, hyperfiltration has been linked with progression of kidney disease in people with type 2 diabetes.)
- Teen-LABS participants saw a 22% decrease in elevated urinary albumin excretion (UAE) - or elevated protein levels in their urine, a key marker of kidney damage; TODAY participants had up to 27-fold greater odds of elevated UAE.
- Teen-LABS participants experienced a 23% decrease in high blood pressure; TODAY participants showed a 40% increase.

"This study further demonstrates that the benefits of bariatric surgery may outweigh the risks and initial costs for carefully chosen patients in a specialized, experienced medical center," said Thomas H. Inge, MD, Ph.D., Teen-LABS principal investigator, and director of pediatric surgery and the bariatric center at Children's Colorado. "While this study is incredibly promising, the initial cost and risks related to bariatric surgery should always be carefully considered."

More information: Petter Bjornstad et al, Effect of

Surgical Versus Medical Therapy on Diabetic Kidney Disease Over 5 Years in Severely Obese Adolescents With Type 2 Diabetes, *Diabetes Care* (2019). DOI: 10.2337/dc19-0708