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Ten-Year Outcomes Following Adolescent Bariatric Surgery

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To the Editor:

Teen Longitudinal Assessment of Bariatric Surgery (Teen-LABS) is a prospective multicenter observational cohort study designed to evaluate adolescents (≤ 19 years of age) undergoing bariatric surgery (NCT # NCT00474318. The protocol is available with the full text of this letter at NEJM.org). Here, we report the 10-year outcomes highlighting durable weight loss and resolution of common obesity-related co-morbidities. Details about the cohort, data collection methods, and definitions for co-morbidities have been previously described and are presented in the Supplementary Appendix.[1–3]

Participating adolescents underwent either gastric bypass (n=161) or sleeve gastrectomy (n=99) at mean age 17 years. Overall, 83% of 10-year post-operative visits were completed (Supplementary Appendix). BMI change and responses of obesity-related comorbidities were examined using propensity score adjusted, linear and generalized mixed models.

Disclosure forms provided by the authors are available with the full text of this letter at NEJM.org.

At 10 years, BMI significantly declined (−20.0% [−22.9, −17.1] (p<0.001);BMI change was similar for gastric bypass (−20.6% [95%CI:−24.8%,−16.4%]) and sleeve gastrectomy (−19.2% [95%CI: −24.8%,−13.5%]) (Figure, Panel A). Latent class analysis identified four distinct BMI change trajectories over time (Figure, Panel B; each colored line represents a distinct trajectory). Cumulative logistical modeling indicated that greater early weight loss (change in BMI at 6 months) was associated with a more favorable long-term BMI trajectory (Odds Ratio: 1.16[1.11,1.21].

Since weight loss and baseline prevalence of type 2 diabetes, hypertension, and dyslipidemia, low HDL cholesterol, and high triglycerides were similar for both surgical procedures in this study, data were collapsed for all comorbidity analyses. Ten years following bariatric surgery, modeled remission rates for type 2 diabetes (55% [95%CI: 35,75], hypertension (57% [95%CI: 39,75], and dyslipidemia (54% [95%CI: 42,66] (Figure, Panel C) demonstrated durability of response for most participants. Notably, type 2 diabetes remission at 10 years far exceeded the 18% to 12% remission reported in adults at 7 to 12 years, respectively, in a recent multi-center randomized controlled trial.[4] Strengths of the present study include its prospective, multicenter design with standardized methodology and high cohort retention (>90%). Limitations include the observational study design, small sample size for certain comorbidity outcomes, and lack of a contemporaneous non-surgical control group.

While there is heterogeneity in weight loss and cardiometabolic risk factor response, these data support recent guidance for surgical treatment for adolescents with severe obesity.[5] Given the more recent utilization of effective anti-obesity medications, it is imperative to directly study the relative efficacy and risks of medical and surgical treatment approaches--both of which hold major promise to improve the lives and health of pediatric patients with severe obesity.

These findings document the long-term durability of weight loss and comorbidity remission and specifically demonstrate the greater health benefits and durability of bariatric surgery in adolescents than would be expected in similarly-treated adults.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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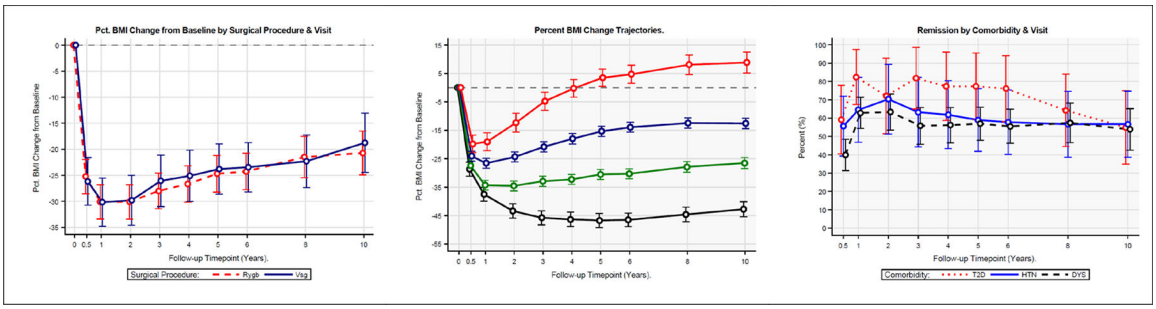

Figure.

Panel A. BMI change for gastric bypass (RYGB) and sleeve gastrectomy (VSG) at 10 years.

Panel B. Latent class analysis of BMI change trajectories over time.

Panel C. Remission (percent) of comorbidities of type 2 diabetes (T2D), hypertension (HTN), and dyslipidemia (DYS) over 10 years.