NEJM GROUP

TOPIC COLLECTION: LIFE EXPECTANCY AFTER BARIATRIC SURGERY

Letter from the Editor

Obesity is associated with increases in life-threatening diseases and premature mortality. Bariatric surgery leads to durable weight loss and reduces the risk for cardiovascular disease, type 2 diabetes, cancer, and all-cause death. The effect of bariatric surgery on life expectancy, however, has not been well defined.

Between 1987 and 2001, Swedish researchers enrolled 2007 adult patients who underwent bariatric surgery and 2040 matched controls who were candidates for bariatric surgery but did not have the procedure. They also randomly selected a similarly-aged reference cohort of 1135 people from a Swedish population registry. Based on data from Sweden's national death registry over a median follow-up period of more than 20 years, the adjusted median life expectancy was 3 years longer in the surgery group than in the control group, but still 5.5 years shorter than in the reference cohort. The residual decrease in life expectancy in surgical patients compared with that in the general population might be explained by such factors as persistent excess weight after surgery or irreversible metabolic changes that began prior to surgery.

In related research recently summarized in NEJM Journal Watch, a large prospective cohort study by Doumouras and colleagues found that reduced mortality after bariatric surgery extended to a variety of patient subgroups; Cohen et al. reported that gastric bypass is more effective than usual care for remission of albuminuria and early chronic kidney disease in obese patients with type 2 diabetes; Schiavon and colleagues presented evidence that fewer medications may be required for blood pressure control in some hypertensive patients who have undergone gastric bypass; and Jayedi and others found that measures of central adiposity (e.g., waist circumference) are independently associated with mortality risk after adjustment for body-mass index.

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ORIGINAL ARTICLE

Life Expectancy after Bariatric Surgery in the Swedish Obese Subjects Study

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ABSTRACT

BACKGROUND

Obesity shortens life expectancy. Bariatric surgery is known to reduce the long-term relative risk of death, but its effect on life expectancy is unclear.

METHODS

We used the Gompertz proportional hazards regression model to compare mortality and life expectancy among patients treated with either bariatric surgery (surgery group) or usual obesity care (control group) in the prospective, controlled Swedish Obese Subjects (SOS) study and participants in the SOS reference study (reference cohort), a random sample from the general population.

RESULTS

In total, 2007 and 2040 patients were included in the surgery group and the control group, respectively, and 1135 participants were included in the reference cohort. At the time of the analysis (December 31, 2018), the median duration of follow-up for mortality was 24 years (interquartile range, 22 to 27) in the surgery group and 22 years (interquartile range, 21 to 27) in the control group; data on mortality were available for 99.9% of patients in the study. In the SOS reference cohort, the median duration of follow-up was 20 years (interquartile range, 19 to 21), and data on mortality were available for 100% of participants. In total, 457 patients (22.8%) in the surgery group and 539 patients (26.4%) in the control group died (hazard ratio, 0.77; 95% confidence interval [CI], 0.68 to 0.87; P<0.001). The corresponding hazard ratio was 0.70 (95% CI, 0.57 to 0.85) for death from cardiovascular disease and 0.77 (95% CI, 0.61 to 0.96) for death from cancer. The adjusted median life expectancy in the surgery group was 3.0 years (95% CI, 1.8 to 4.2) longer than in the control group but 5.5 years shorter than in the general population. The 90-day postoperative mortality was 0.2%, and 2.9% of the patients in the surgery group underwent repeat surgery.

CONCLUSIONS

Among patients with obesity, bariatric surgery was associated with longer life expectancy than usual obesity care. Mortality remained higher in both groups than in the general population. (Funded by the Swedish Research Council and others; SOS ClinicalTrials.gov number, NCT01479452.)

From the Institutes of Medicine (L.M.S.C K.S., P.J., J.C.A.-A., P.-A.S., M.T., B.C and Health and Care Sciences (P.-A.S. Sahlgrenska Academy at the University Gothenburg, and Early Cardiovascula Renal, and Metabolism (CVRM), Bi pharmaceuticals Research and Develo ment, AstraZeneca (B.C.), Gothenbur and the Department of Neurobiolog Care Sciences and Society, Karolinska I stitutet, Solna (M.P.) — both in Swede and the Public Health Promotion Uni National Institute for Health and We fare, Helsinki (M.P.). Address reprint r quests to Dr. Carlsson at SOS Secretaria Vita Stråket 15, Sahlgrenska Universi Hospital, S-413 45 Gothenburg, Swede or at lena.carlsson@medic.gu.se.

N Engl J Med 2020;383:1535-43.
DOI: 10.1056/NEJMoa2002449

Lower 5-Year All-Cause Mortality After Bariatric Surgery

In an observational study, lower mortality was noted in several patient subgroups.

Several observational studies have shown lower mortality in patients who undergo bariatric surgery, but adjustment for potentially confounding variables and analysis of subgroups has been limited. Using public health databases, investigators identified 13,000 patients who underwent bariatric surgery in Ontario, Canada, between 2010 and 2016 (81% women; mean age, 45; mean body-mass index [BMI], 47 kg/m^2); each patient was matched by age, sex, BMI, and diabetes status with a patient who was eligible for surgery but did not undergo it. Following local guidelines, 87% of bariatric surgeries were gastric bypasses, and 13% were sleeve gastrectomies.

At 5-year follow-up, significantly fewer deaths had occurred in the surgical group than in controls (1.4% vs. 2.5%). In subgroup analyses, surgery was associated with lower mortality among both men and women, among patients older than 55, among those with BMIs higher than 40 kg/m^2, and among those who underwent gastric bypass (vs. sleeve gastrectomy). Bariatric surgery was associated with significantly fewer cardiovascular- and cancer-related deaths (and other medical mortality) but not deaths due to trauma.

COMMENT

The lack of significant mortality benefit among patients who underwent sleeve gastrectomy in this study might have been attributable to insufficient sample size. The authors suggest that, based on these results, more men and more older patients might benefit from bariatric surgery. ***— Bruce Soloway, MD***

Doumouras AG et al. Association between bariatric surgery and all-cause mortality: A population-based matched cohort study in a universal health care system. **Ann Intern Med** *2020 Aug 18; [e-pub]. (https://doi.org/10.7326/M19-3925)*

Gastric Bypass Surgery in Patients with Diabetes and Microalbuminuria

Microalbuminuria remitted more commonly with surgery than with medical management.

Bariatric surgery is superior to intensive medical therapy for weight loss and improved metabolic function in appropriately selected patients. In this trial, researchers looked specifically at the effect of bariatric surgery on proteinuria in 100 obese patients with type 2 diabetes and microalbuminuria (median urinary albumin-creatinine ratio [uACR], 73 mg/g). At baseline, mean age was 51, mean body-mass index was 33 kg/m^2, and median serum creatinine was 0.8 mg/dL. Patients were randomized to receive either laparoscopic roux-en-Y gastric bypass or best medical therapy.

At 24 months, microalbuminuria had resolved (uACR levels, <30 mg/g) in 84% of the gastric bypass group versus 56% of the medical therapy group. Mean weight loss among patients in the gastric bypass group was 25.4% compared with 4.5% in the medical therapy group. Incidence of serious adverse events was similar in both groups.

COMMENT

This study shows that gastric bypass surgery can improve microalbuminuria in type 2 diabetes patients with otherwise preserved renal function. Given that follow-up was only 2 years, it remains unclear whether this outcome will translate into long-term improvement in clinically meaningful renal outcomes.
— Thomas L. Schwenk, MD

Cohen RV et al. Effect of gastric bypass vs best medical treatment on early-stage chronic kidney disease in patients with type 2 diabetes and obesity: A randomized clinical trial. **JAMA Surg** *2020 Jun 3; [e-pub]. (https://doi.org/10.1001/jamasurg.2020.0420)*

Gastric Bypass Surgery Might Reduce Dependence on Blood Pressure Medications

In a randomized trial, surgical patients needed fewer BP medications than did patients who received medical therapy alone.

In obese patients with poorly controlled diabetes, bariatric surgery improves glycemic control and often leads to long-term remission of diabetes. The effect of bariatric surgery on hypertension has been less-well studied. At a single center in Brazil, researchers randomized 100 adult patients with hypertension and body-mass index between 30.0 and 39.9 kg/m^2 to undergo Roux-en-Y gastric bypass (RYGB) plus standardized medical therapy or medical therapy alone. At baseline, patients were treated with ≥2 antihypertensive drugs at maximal doses or ≥3 drugs at moderate doses. In previously published 1-year follow-up data from this trial, significantly more patients who had RYGB reached the primary outcome (84% vs. 13%) — reduction by at least 30% in the number of antihypertensive medications, while maintaining blood pressure (BP) at <140/90 mm Hg (*Circulation* 2018; 137:1132).

The authors now present additional follow-up data. At 3 years, 73% of RYGB patients and 11% of medical-therapy patients achieved the primary outcome. In addition, significantly more RYGB patients than medical-therapy patients (35% vs. 2%) had BP <140/90 mm Hg without any medications. Overall BP control (with or without medications) was similar in both groups.

COMMENT

This study suggests that gastric bypass surgery might help reduce polypharmacy for some patients with hypertension who are moderately obese. Decisions about bariatric surgery must, of course, be based on a consideration of a multitude of potential risks and benefits. ***— Bruce Soloway, MD***

Schiavon CA et al. Three-year outcomes of bariatric surgery in patients with obesity and hypertension: A randomized clinical trial. **Ann Intern Med** *2020 Aug 18; [e-pub]. (https://doi.org/10.7326/M19-3781)*

Abdominal Obesity Is Associated with Early All-Cause Mortality

Mortality risk increased nearly linearly in men and women with waist circumferences greater than 90 cm and 80 cm, respectively.

Higher body-mass index (BMI) is associated with earlier all-cause mortality, but BMI fails to distinguish between muscle mass and fat mass or between deleterious visceral and abdominal fat and protective gluteal and thigh fat. Central obesity is more difficult to measure but can add valuable information about mortality risk. Researchers conducted a systematic review and meta-analysis of 72 prospective cohort studies that each reported at least three measures of central adiposity and their association with all-cause mortality.

All measures of central adiposity (e.g., waist circumference, waist-to-hip ratio) were associated positively and significantly with higher risk for early all-cause mortality. In many cases, associations were nonlinear (i.e., J-shaped or U-shaped), but for most measures, there were clear cutoffs above which mortality risk rose continuously. For example, mortality risk increased nearly linearly in men and women with waist circumferences greater than 90 cm and 80 cm, respectively. The associations remained significant after adjustment for BMI, indicating that central obesity confers risk independent of overall obesity.

COMMENT

Over the years, BMI has been thoroughly integrated into our electronic records, our definitions of obesity, and our criteria for interventions such as bariatric surgery. Although waist circumference is easy enough to measure, we will need to revise systems and guidelines, not just individual practice, to incorporate the data provided by this study into our daily clinical decisions.

— Bruce Soloway, MD

Jayedi A et al. Central fatness and risk of all cause mortality: Systematic review and dose-response meta-analysis of 72 prospective cohort studies. **BMJ** *2020 Sep 23; 370:m3324. (https://doi.org/10.1136/bmj.m3324)*