

Bariatric Surgery Lowers Cardiovascular Risk

Study monitored eight markers of cardiovascular risk, all of which were improved by gastric bypass.

BY DAMIAN McNAMARA
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ORLANDO — The clinical benefits of gastric bypass surgery go beyond weight loss and include lowering the risk of coronary artery disease, according to the results of a study presented by D. Brandon Williams, M.D., at the annual meeting of the American Society for Bariatric Surgery.

Obesity is among the major risk factors for coronary heart disease and stroke, and that risk may be particularly high among the morbidly obese, Dr. Williams said.

In a prospective study, Dr. Williams and coinvestigators monitored 8 markers of cardiovascular risk in 222 morbidly obese patients before and after gastric bypass surgery.

The markers—which included both traditional and emerging biochemical measurements—improved up to 1 year after surgery, compared with preoperative values, said Dr. Williams, a surgery resident at Stanford University Medical Center in Palo Alto, Calif. Gastric bypass is the most common form of weight loss surgery at Stanford.

All participants had Roux-en-Y gastric bypass surgery; 99% of the procedures were laparoscopic. The mean age of the patients was 43 years, and 84% were female.

At baseline, 31% of the subjects were diabetic, 50% were hypertensive, and 18% were taking lipid-lowering medication.

“Patients had a high percentage of elevated risk factors,” Dr. Williams said. Only

1% had known coronary artery disease at enrollment.

Researchers measured traditional laboratory values, including total cholesterol, triglycerides, LDL cholesterol, and HDL cholesterol, at 3 months and 6 months after surgery.

But “our markers are not perfect,” Dr. Williams said. Therefore, they also assessed three emerging markers: lipoprotein (a), homocysteine, and C-reactive protein.

Total cholesterol lipids initially decreased from a mean 201 mg/dL preoperatively to 168 at 3 months and then slightly increased to 169 at 6 months after surgery.

Triglycerides decreased from a mean 188 mg/dL to 129 at 3 months and 119 at 6 months.

LDL cholesterol was a mean 181 mg/dL preoperatively and decreased to 112 at 3 months and 102 at 6 months.

HDL cholesterol initially dropped after surgery but then improved, Dr. Williams reported. From a baseline mean of 47 mg/dL, HDL decreased to 42 at 3 months but increased to 49 at 6 months.

Researchers observed similar improvements in the other risk factors.

For example, from a preoperative value of 36 mg/L, lipoprotein (a) changed to 25 at 3 months and 30 at 6 months. From a baseline mean of 10.8 mmol/L, homocysteine decreased to 9.9 at 3 months and 9.5 at 6 months.

The eighth indicator of risk was body mass index.

The mean body mass index was 47 kg/m² before surgery and dropped to 39

at 3 months and 35 at 6 months.

Although all the markers improved postoperatively, there was “a dramatic improvement” in C-reactive protein (CRP) over time, Dr. Williams said. From a preoperative mean value of 10.7 mg/L, CRP decreased to 8.1 at 3 months and 4.2 at 6 months. A growing number of studies indicate that abnormally high levels of CRP and some other blood proteins indicate elevated cardiovascular disease risk. “Even with low total cholesterol, CRP remains a strong cardiovascular risk factor,” Dr. Williams said.

CRP is the strongest of the biochemical risk factors, he added, followed by the total cholesterol/HDL ratio. “Combined, these two are even stronger.”

A total of 80% of participants had abnormal CRP values preoperatively, indicating that the morbidly obese are extremely vulnerable to cardiac disease, according to John Morton, M.D., senior author of the study and director of bariatric surgery at Stanford. “The new risk factors, in particular C-reactive protein, have been shown to add substantially to risk assessment,” Dr. Williams added. “About half of strokes and myocardial infarctions occur in people with normal LDL, so C-reactive protein adds to the risk assessment.”

Lipoprotein (a) is helpful because it does

not simply mirror the lipid profile, he explained. Similar in structure to LDL cholesterol, lipoprotein (a) is involved in atherothrombosis, a risk factor for premature coronary artery disease.

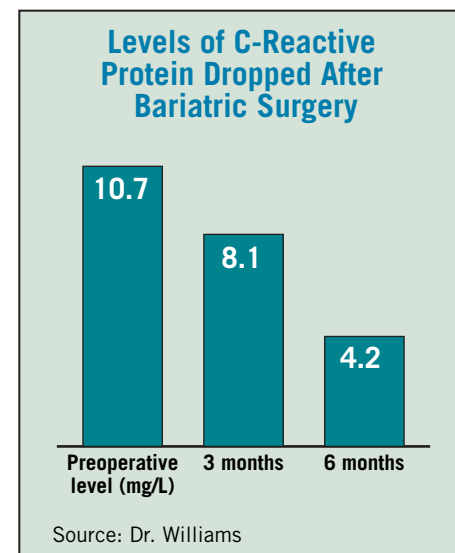
Homocysteine measurements are useful because homocysteine is prothrombotic and an independent predictor of coronary artery disease.

A meeting attendee asked Dr. Williams if he found a correlation between the magnitude of individual weight loss and improvement in risk factors. “There was a correlation, but it was somewhat low, implying there are other factors involved,” he replied. “For example, diet and exercise can improve C-reactive protein.”

Although other

weight loss strategies could lower cardiovascular risk, “the only effective and enduring long-term therapy for obesity is bariatric surgery,” Dr. Williams said. Obesity and smoking are the primary modifiable coronary artery disease risk factors, he added. “Smoking has decreased, but obesity is on the rise.”

The study was completed in March 2005 to include a total of 371 participants and up to 12 months of follow-up data. Updated findings still demonstrated improvements in all eight risk factors after gastric bypass surgery, Dr. Williams commented. ■



Look Beyond BMI in Gauging Cardiovascular Risk of the Obese

BY DAMIAN McNAMARA
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ORLANDO — Body mass index alone is not a good indicator of cardiovascular risk in the morbidly obese and should be supplemented with body habitus measures for screening bariatric surgery candidates, Edward H. Livingston, M.D., said at the annual meeting of the American Society for Bariatric Surgery.

“We rely on BMI as the basis of all bariatric surgery criteria. BMI is thought to correlate to morbidity, but the relationship is not perfect,” said Dr. Livingston, professor of surgery at the University of Texas, Dallas.

In an effort to go beyond BMI, he and his associates looked at several body habitus measures in 7,634 healthy volunteers who participated in the third National Health and Nutrition Examination Survey (NHANES III).

All of the subjects were at least 18 years of age. Overall, the study population was 53% female, and the ethnic breakdown was 41% white, 28% black, 27% Hispanic, and 4% other.

The body habitus measures examined were subcutaneous skinfold thickness, waist circumference, waist-to-hip ratio, and waist-to-thigh ratio.

The research team analyzed the contribution of these measures to insulin resistance and diabetes mellitus, two important factors underlying cardiovascular disease. The measures were analyzed according to gender.

The investigators found significant correlations between all the body measures and both insulin resistance and diabetes mellitus, except for suprailiac skinfold thickness and development of diabetes in men, Dr. Livingston said.

Interestingly, thigh skinfold thickness was a strong negative predictor for the development of obesity and diabetes mellitus (0.31 odds ratio for diabetes among women and 0.38 among men), Dr. Livingston reported. This suggests that accumulation of fat in the lower body protects

against insulin resistance and diabetes mellitus, he noted.

Surprisingly, the study indicated that cardiovascular risk profiles actually improved for some people with a BMI over 35 kg/m², compared with those individuals with a lower BMI. For example, triglycerides typically rise as a function of BMI but drop off after 35, Dr. Livingston said.

‘One reason people get really huge is an unlimited ability to store subcutaneous fat from food they [eat]. It may not mean they have higher cardiovascular risk.’

“If we are operating on the basis of BMI, we are operating on the wrong people,” he commented.

“I operate on a large number of patients, and I’m surprised at the small number of cardiovascular complications I see. You would expect to see more cardiovascular disease in the population we treat,” Dr. Livingston noted. “One reason people get really huge is an unlimited ability to store subcutaneous fat from the food they take in. It may not mean they have an elevated cardiovascular risk.”

In response to a meeting attendee’s question, Dr. Livingston further explained that “the relationship of central obesity to cardiovascular risk factors has been overstated. A number of studies show cardiovascular disease is a function of total upper body fat and not visceral fat.”

The heterogeneity of body fat distribution among obese patients may explain the discrepancy in findings among different studies that have linked BMI to mortality, Dr. Livingston said.

Since 1991, the National Institutes of Health has recommended bariatric surgery for appropriate candidates with a body mass index of 40 or greater. The NIH consensus statement addressed concerns about increased mortality in this patient population.

Although cardiovascular disease is the leading cause of death in the morbidly obese, the relationship to BMI is not direct, Dr. Livingston said.

The results of the study suggest that body habitus measurements should be incorporated into routine screening of candidates for bariatric surgery, Dr. Livingston explained. ■