

# Obesity-Preeclampsia Linkage May Be Vascular

*Vessel inflammation might increase risk by releasing reactive oxygen species and immunostimulants.*

BY MITCHEL L. ZOLER  
Philadelphia Bureau

LISBON — Neutrophil infiltration and vascular inflammation were substantially more prevalent and severe in blood vessels from overweight and obese women than in vessels taken from normal-weight women in a study of 22 women.

"The data indicate that the vasculature of obese women is inflamed and susceptible to developing hypertension," Scott W. Walsh, Ph.D., said at the 15th World Congress of the International Society for the Study of Hypertension in Pregnancy.

"We speculate that neutrophil infiltration and vascular inflammation puts obese women at risk for preeclampsia" through the release of reactive oxygen species and immunostimulants. This may explain why obesity is a risk factor for preeclampsia. Until now, the pathophysiologic link between obesity and preeclampsia has been unclear, said Dr. Walsh, a professor of ob.gyn. at Virginia Commonwealth University in Richmond.

Dr. Walsh and his associates assessed neutrophil infiltration and vascular inflammation in the blood vessels of adipose

tissue biopsies taken from volunteers. Participating women were divided into three groups based on their body mass index. Five normal-weight women had a BMI of less than 25 kg/m<sup>2</sup>, 7 overweight women had a BMI of 25-29.9 kg/m<sup>2</sup>, and 10 obese women had a BMI of at least 30 kg/m<sup>2</sup>.

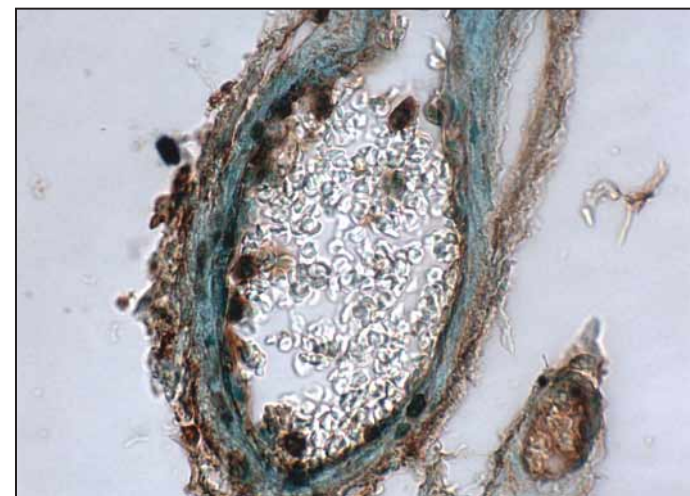
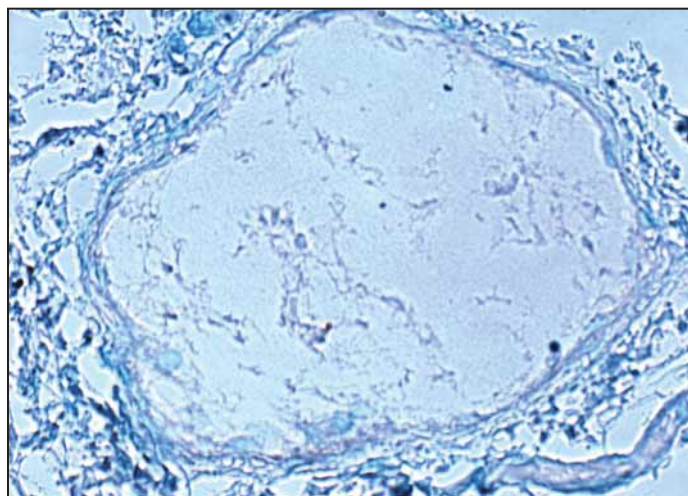
Neutrophil infiltration was measured using a monoclonal-antibody stain against CD66b, a granulocyte membrane antigen

(about 96% of granulocytes in blood vessels are neutrophils). Inflammation was measured with monoclonal-antibody stains against two markers of inflammation, NF-kB and cyclooxygenase (COX)-2. The extent of vessel staining with these reagents was gauged in fixed, adipose tissue specimens by two measures: a visual score scale of 0-3 and stained vessels as a percent of all vessels examined.

By both measurements, all three stains were significantly increased in both overweight and obese women, compared with the normal-weight controls. The greatest

staining was in the vessels from obese women. For example, for NF-kB staining, the visual score was about 0.3 in biopsies from normal-weight women, about 1.1 in overweight women, and about 2.6 in obese women. The percent of vessels stained was about 28%, 60%, and 90%, respectively. Similar results were obtained with the stains for neutrophils and for COX-2.

The patterns in adipose tissue are likely to be representative of the entire vasculature, and in fact, inflammation may be even more extensive in certain other vascular beds in each woman, Dr. Walsh said. ■



In blood vessels that were stained for the cytokine NF-kB, the control specimen (left) is from a normal-weight woman and shows no NF-kB staining; the specimen on the right, from a woman with a BMI of at least 30 kg/m<sup>2</sup>, shows heavy staining.

PHOTOS COURTESY DR. SCOTT W. WALSH

## Adolescents Show Good Compliance After Bariatric Surgery

BY JEFF EVANS  
Senior Writer

SAN FRANCISCO — Few morbidly obese adolescents are referred for bariatric surgery, despite the high rate of failure with conservative interventions. But short-term outcomes and compliance in teens undergoing Roux-en-Y gastric bypass, laparoscopic adjustable gastric banding, or biliopancreatic diversion are as good as those of older patients, according to findings from a series of small retrospective studies presented at the annual meeting of the American Society for Bariatric Surgery.

Those who object to doing bariatric surgery in adolescents question "whether teenagers will comply with the treatment regimen," said Dr. George A. Fielding of the surgical weight loss program at New York University, New York. "It's been postulated that kids won't do this just by the nature of being a teenager."

While in Dr. Fielding's care at the NYU Medical Center, 81 adolescents have received laparoscopic adjustable gastric banding (LAGB). Five of the patients were aged 12-13 years, 55 were aged 14-17 years, and 21 were aged 18-19 years. Most (60) were girls and weighed an average of 137 kg with a mean body mass index (BMI) of 48 kg/m<sup>2</sup>.

After 1 year of follow-up in 32 patients, the patients lost 57% of their excess weight on average and had a mean BMI of 34. All comorbidities were resolved, except for two patients who needed to maintain antidepressant therapy.

Banding adjustments at follow-up visits

is a "key issue to the management of all LAGB patients, and it's no different with children," Dr. Fielding pointed out.

During the first year of follow-up in 27 patients aged 14-17 years, an average of 6.5 banding adjustments were made during 10 visits. This led to an average of 64% excess weight lost; only 2 of these 27 patients lost less than 50% of their excess weight, Dr. Fielding said.

Most patients reported that they were much less hungry and were eating a substantially smaller volume of food than they had been preoperatively. Very few had a desire to binge eat, he said.

The decision to undergo LAGB had been made mostly by the adolescents rather than by their parents, Dr. Fielding said. When performing LAGB in adolescents in Australia and in New York, he has taken a hands-off approach. "If you tell teenagers they can do pretty much what they like, they'll rear back in shock and usually do what you ask them to," he said.

In a separate report, Dr. Jose S. Pinheiro of the Hospital São Camilo, São Paulo, Brazil, reviewed his center's experience in performing laparoscopic Roux-en-Y gastric bypass surgery in 49 adolescents with a mean age of 16 years. The patients, 35 of whom were male, all received preoperative psychiatric evaluations and had full parental support.

The laparoscopic RYGBs involved an antecolic, antegastric approach and used a 50-cm biliary limb and a 150-cm alimentary limb. No patients died or had complications during surgery, and their average hospital stay was 30 hours.

The patients' mean BMI dropped from 45 before surgery to 23.5 at a mean follow-up of 48 months. All obesity-related comorbidities resolved after surgery.

Dr. Pinheiro and his colleagues are still collecting quality of life data, but he said that all of the patients are happy with the surgery and are committed to becoming healthier. "The patients were extremely compliant with treatment," Dr. Pinheiro said, noting that all of them exercised on a regular basis. "Gastric bypass should be offered as an option in the treatment of obese adolescents," he added.

When adolescents are referred for bariatric surgery, they are usually offered a restrictive procedure, said Dr. Francesco S. Papadia of the department of surgery at the University of Genoa (Italy). Malabsorptive procedures such as biliopancreatic diversion (BPD) are "considered unsuitable a priori despite the lack of any evidence" against its safety or effectiveness in adolescents.

During 1976-2005, 76 adolescents received BPD surgery at the University of Genoa. Excluding 7 patients with Prader-Willi syndrome and 1 with Turner's syndrome, the remaining 68 had a mean of 11 years of follow-up, ranging from 2 to 23 years. On average, the patients were nearly 17 years of age at the time of the operation, weighed 125 kg, and had a BMI of 46. No patients died during surgery, and one had a wound dehiscence.

At their longest point of follow-up, patients lost a mean of 78% of their excess weight. Four patients lost less than 50% of excess weight. Of those, three underwent

a revision and one was converted from a vertical banded gastroplasty with a preoperative BMI of 26.

Obesity-related comorbidities resolved in a significant percentage of patients; hypertension was reduced from 49% to 9%, dyslipidemia from 16% to 0%, and glucose-intolerant or type 2 diabetes from 7% to 0%.

Twelve patients developed protein malnutrition at some point 1-10 years after surgery, and two patients had recurrent protein malnutrition. Those who experienced protein malnutrition after surgery had significantly higher initial body weight and BMI than did those who did not have malnutrition.

The incidence of protein malnutrition decreased steadily during the 30-year period of the study from 30% in the first few years to 2% in the last few years. The length of the common limb remained 50 cm, but as the surgeons gained experience, they adapted alimentary limb lengths to individual characteristics, and gastric sizes were not restricted to prevent protein malnutrition, Dr. Papadia said.

In a range of 4-18 years after BPD surgery, 18 women gave birth to 28 healthy infants. One infant was mentally retarded. Another two women died of severe protein malnutrition at the end of their pregnancies.

A total of 19 reoperations were performed in 14 patients, including 5 elongations and 2 restorations. Overall, three patients in the cohort died (4%)—two from protein malnutrition during pregnancy and one from acute pancreatitis. ■