Type 1, Type 2 Diabetes Seen Together in Children

BY ROBERT FINN
San Francisco Bureau

San Francisco — The rise in the diagnosis of type 2 diabetes among children is calling attention to certain differences in disease characteristics between children and adults, Dr. Francine Ratner Kaufman, reported at the Third World Congress on Insulin Resistance Syndrome.

In fact, some children seem to have a form of diabetes that's a hybrid between type 1 and type 2, said Dr. Kaufman of the University of Southern California, Los Angeles. Workers in the field have used a variety of designations for this, including "hybrid diabetes," "double diabetes," "type 1.5," and "type 3."

The typical child with type 1 diabetes will have a positive antibody test and low fasting C-peptide values. The situation is reversed in the typical child with type 2 diabetes–negative antibodies and high fasting C-peptide. But some children have a positive antibody test along with high fasting C-peptide levels. It's those children who have the hybrid form.

"A fair number of these children who come looking as if they have type 2 diabetes also have evidence of islet-cell autoimmunity," Dr. Kaufman said. "Whether that represents that they have type 1 or type 2 diabetes or that this evidence of antibody is a different phenomenon than it is in the adult population, we don't know."

Before insulin pumps and refined glucose control, children with type 1 diabetes were typically underweight. Better control means that more of these children are of normal weight, and about 20% may even be obese. That means that obesity alone cannot be used to distinguish type 1 from type 2 disease, even though at least 85% of children with type 2 diabetes are overweight or obese.

Type 2 diabetes seems to take a somewhat different course in children than in adults. In adults the disease is often indolent, preceded by a long asymptomatic period. Screening reveals many adults who have undiagnosed type 2 diabetes. In contrast, at least five studies of overweight children, who would be expected to be at high risk of type 2 diabetes, have found very low rates—6% or less—of undiagnosed type 2 diabetes. This may indicate that children progress more rapidly than do adults through progressive B-cell failure to type 2 diabetes.

A recent study found few parameters that can help distinguish children who have impaired glucose tolerance and will go on to develop type 2 diabetes from those who will revert to normal glucose tolerance (Diabetes Care 2005;28:902-9). The two groups were similar in fasting and postprandial glucose, insulin, and C-peptide levels, for example. The best predictor turned out to be rapid increases in weight and body mass index.

Similarities between the two types, along with the presence of a hybrid form, argue for the "accelerator hypothesis," which views type 1 and type 2 diabetes as the same disorder of insulin resistance, set against different genetic backgrounds, Dr. Kaufman said. ■

First Gastric Banding Trial for Obese Adolescents Underway

BY SHERRY BOSCHERT
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Salt Lake City — Recruitment is underway for participants in the first U.S. study of laparoscopic adjustable banding for obese adolescents, Dr. Ai-Xuan Le Holterman said in a poster presentation at the annual meeting of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition.

Early data on the off-label use of the procedure for obese adolescents in the United States are the basis for the study protocol, which will recruit 50 patients and follow them for 5 years after the surgery. Ten adolescents have enrolled so far, and it may take 3 years before enrollment is complete because of the study's strict protocol, Dr. Holterman said.

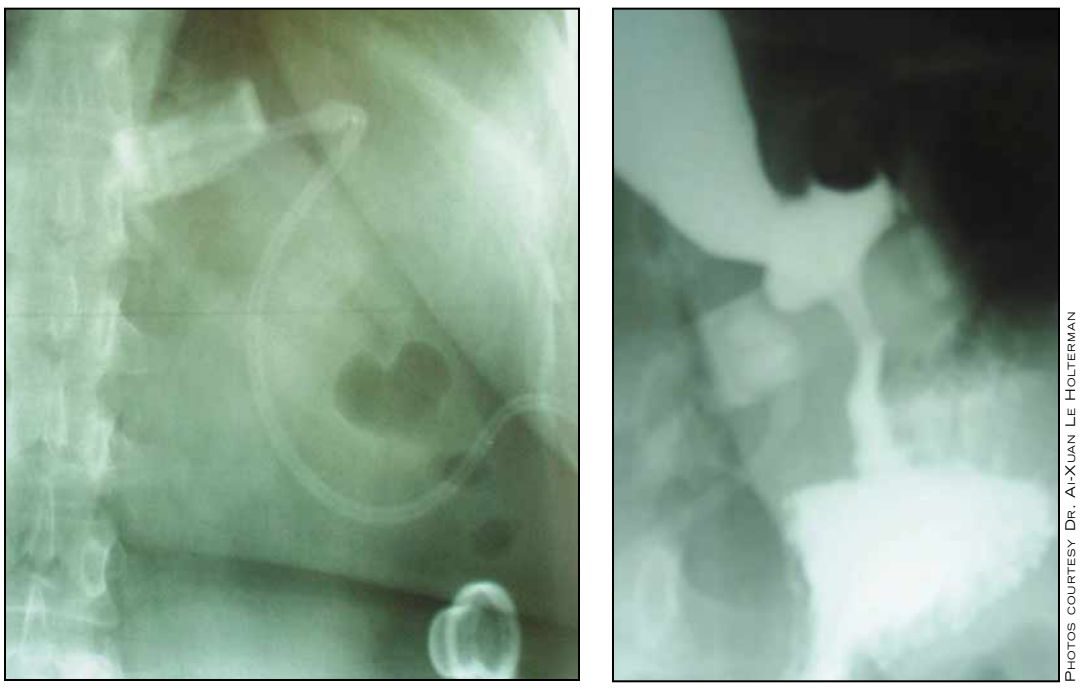
The surgery seemed as effective in 10 adolescents as in 506 U.S. adults, said Dr. Holterman of the University of Illinois at Chicago. The adult data were drawn from patients who received laparoscopic adjustable gastric banding at the University of Illinois as part of the clinical trial that led to Food and Drug Administration approval in 2001 of the LAP-BAND device.

Dr. Holterman and her associates found that operative times and hospital stays were short, and no one died. The surgery required 55 minutes in adolescents and 66 minutes in adults. Hospitalizations lasted 12 and 22 days, respectively. On average, body mass index (BMI) for adolescents fell from 49 kg/m^2 before surgery to 34 at 18 months post surgery, with an estimated 57% weight loss at that follow-up. In adults, the average BMI fell from 47 before surgery to 37 at the 18-month follow-up, with an estimated 39% weight loss.

The adolescents had a much higher complication rate, however, with three patients (30%) developing pouch enlargement, compared with 11% of adults. The pouch enlargement required reoperation to reposition or replace the band in two adolescents (20%) and 2% of adults. More than 90% of patients with pouch enlargement usually can be treated successfully with band deflation, so the higher reoperation rate among adolescents probably reflects a delay in diagnosis of the complication.

"The highest challenge of laparoscopic adjustable gastric banding treatment for morbid obesity in adolescents is the postoperative management," Dr. Holterman said. "Close and long-term follow-up, ensuring diet compliance, and maintaining a high index of suspicion for early detection and treatment of pouch dilatation are essential."

The investigators designed the trial's protocol to include closer and more frequent follow-up of the adolescents than is called for by adult protocols. So far, none of the adolescent patients enrolled in the trial have developed pouch enlargement.



Photos courtesy Dr. Ai-Xuan Le Holterman

The LAP-BAND device is shown in the correct 45-degree position before a final adjustment (left). After surgery, esophageal and gastric pouch emptying without dilation is evident (right).

In gastric bypass surgery, gastric stapling restricts food intake, and an intestinal bypass adds malabsorption to promote weight loss. In laparoscopic gastric banding, surgeons place an adjustable silicone band that induces weight loss by creating a small proximal gastric pouch. The outlet of the pouch is adjusted by controlling the lumen of the band through an inflatable reservoir accessed via a subcutaneous port.

"We encourage people to consider this before bypass because this is reversible and can be tailored to the changing lifestyle of the patient," Dr. Holterman said. Complications are treated laparoscopically.

The prevalence of obesity in U.S. children and adolescents has tripled in the past 3 decades. The procedures offer an alternative for morbidly obese patients for whom medical therapies have not worked

The impermanence of adjustable gastric bands is a drawback in the eyes of Dr. Michael Helmrath, a pediatric surgeon at Texas Children's Hospital, Houston. Experience in adults shows that the bands break in a few patients each year, necessitating replacement.

"You're dealing with a problem that is lifelong. There isn't an implantable device that's going to last the lifetime of a patient," he said in an interview. Dr. Helmrath prefers to perform gastric bypass surgery for morbidly obese patients who fail other therapies, at least until more data emerge comparing surgical options.

Gastric bypass surgery, however, has taken a hit from two recent studies showing higher than expected rates of death and complications in some adults.

In one large study, 40% of patients were readmitted to the hospital one or more times during the 3 years after gastric bypass, double their hospitalization rate in the 3 years before the surgery (JAMA 2005; 294:1918-24). Another study found that 5% of Medicare patients receiving gastric bypass died within 30 days, more than double the death rates seen with other surgical procedures commonly performed on the elderly (JAMA 2005;294:1903-8).

Although gastric bypass carries higher risks of death or complications in the first year after surgery, gastric banding may have more long-term complications, Dr. Helmrath said. Gastric bypass can lead to strictures, anastomotic leaks, or internal hernias, but adjustable gastric banding can lead to GI reflux, port erosions, and band slippage or breaking, among other complications. There are no studies comparing the two surgical procedures in adolescents.

"It's important for someone like me to get data from a good place, like the University of Illinois at Chicago, to help make decisions in the future," Dr. Helmrath said.

Dr. Robert E. Kramer agreed that systematic, evidence-based data are needed on surgical options to help the 11 million obese children in the United States. Laparoscopic adjustable gastric banding is attractive because "if there are complications, or it doesn't seem successful, there at least is the option of removing the device and going back to the original anatomy," said Dr. Kramer, medical director of a pediatric obesity clinic at the University of Miami.

"We see a lot of teenagers who come in, and they're looking for a quick fix," he said in an interview. "It's difficult for them to truly appreciate the risk associated with bariatric surgery." For that reason, he favors restricting bariatric surgery for adolescents to tertiary care centers that offer it as part of a comprehensive obesity management program for children. ■