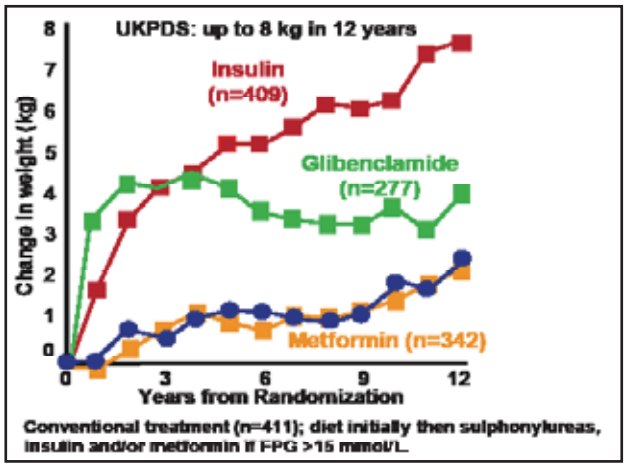
Taking Action on Excess Visceral Fat

Written by Rita Buckley

The dual pandemics of obesity and diabetes threaten to overwhelm the health systems of countries the world over. What can we do about abdominal obesity? Luc Van Gaal, MD, PhD, Antwerp University Hospital, Antwerp, Belgium, addressed challenges and options for dealing with abdominal obesity-related conditions.

Conventional antidiabetes therapies often increase weight (Figure 1) [UK Prospective Diabetes Study 34. *Lancet* 1998; Kahn SE et al. *N Engl J Med* 2006]. A cross-sectional evaluation of participants with type 2 diabetes in the Look AHEAD trial showed that adipose tissue distribution is significantly altered in these patients [Gallagher D et al. *Am J Clin Nutr* 2009].

Figure 1. Weight Increase With Conventional Approaches for the Treatment of Type 2 Diabetes.



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According to Prof. Van Gaal, 3 key actions to address this problem include 1) assess risk (ie, visceral fat and comorbid conditions), 2) initiate interventions to reduce total and visceral fat, such as lifestyle changes, pharmacotherapy, and weight loss surgery, and 3) institute preventive measures.

In a recent meta-analysis, Ismail et al. [*Obes Rev* 2012] assessed the efficacy of exercise interventions on visceral adipose tissue (VAT) content and volume in overweight and obese adults. Data suggested that aerobic exercise in this population is central for exercise programs aimed at reducing VAT. Albu et al [*Diabetes* 2010] found that changes in overall weight (adipose tissue mass) and hepatic fat were the most important determinants of metabolic improvements.

Pharmacotherapy includes central-acting drugs (eg, sibutramine and topiramate/phentermine combination); lipase inhibition (ie, orlistat); and glucose-lowering drugs. In 1998, Van Gaal et al. [*Int J Obes Relat Metab Disord* 1998] reported that sibutramine produced statistically and clinically significant decreases in waist circumference and waist-to-hip ratio, and preferentially reduced visceral fat levels. Last year, Gadde et al. [*Lancet* 2011] found significant improvements in comorbid conditions with a topiramate/phentermine combination.

Peer-Reviewed Highlights from the

3rd International Congress on Abdominal Obesity

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New and future drugs that target intra-abdominal fat include second-generation peripheral cannabinoid 1 antagonists, 11 β hydroxysteroid dehydrogenase inhibitor, glucagon-like peptide (GLP)-1 analogs/mimetics, sodium glucose cotransporter (SGLT)-2 inhibitors, and leptin-pramlintide combination.

In an investigation of the effects of GLP-1 analog liraglutide, Inoue et al. [*Cardiovasc Diabetol* 2011] found that liraglutide significantly reduced estimated visceral fat compared with no significant change before medication induction ($p<0.005$). A study on dapagliflozin, a SGLT-2 inhibitor, showed a decrease in total body weight at Week 24, predominantly by reducing fat mass, VAT, and subcutaneous adipose tissue in patients with type 2 diabetes inadequately controlled by metformin [Bolinder J et al. *J Clin Endocrinol Metab* 2012].

Resolution of type 2 diabetes is known to be an additional benefit of surgical treatment for severe obesity [Pories WJ et al. *Ann Surg* 1995], with glycemic control often occurring long before significant weight loss [Mingrone G et al. *Diabetologia* 1997]. Buchwald et al. [*JAMA* 2004] reported 98.9% resolution of diabetes with the biliopancreatic diversion or duodenal switch technique and 83.7% for gastric bypass. Data from a subanalysis of the European Hepatic and Adipose Tissue and Functions in the Metabolic Syndrome project found decreases of 25.4±5.9% in weight (kg) and 50±8% in VAT (cm) after bariatric surgery (Table 1) [Van Gaal LJ et al. Subanalysis of EU HEPADIP Project].

Table 1. Visceral Fat Loss After Weight-Loss Surgery.

	Baseline	Follow-up	Change	% Change
Weight (kg) n=20	132.3±38.1	99.4±33.0	-32.9±10.1	-25.4±5.9
VAT (cm^2) n=19	206.0±101.0	120.0±72.0	-100.0±46.0	-50.0±8.0

VAT=visceral adipose tissue.

Sugar-Sweetened Beverages Linked to Multiple Health Risks

Written by Rita Buckley

Limiting intake of sugar-sweetened beverages is one simple change that could have a measurable impact on weight control and the risk of diabetes and other metabolic diseases in the general population, according to Frank Hu, MD, PhD, Harvard School of Public Health, Harvard Medical School, Boston, Massachusetts, USA. Dr. Hu presented data on sugar-sweetened beverages and their impact on public health.

Dr. Hu said sugar-sweetened beverages, such as sodas, fruit drinks, energy drinks, and sports drinks, are as common and familiar as they are dangerous to our health, and adults are as vulnerable as children. Between 1965 and 2002, per capita consumption of daily calories from sugar-sweetened beverages increased steadily in adults and children, while consumption of milk declined [Duffey KJ, Popkin BM. *Obesity* 2007]. By 2005 to 2006, daily consumption of sugar-sweetened beverages was approximately 172 kcal for children and 175 kcal for adults [Brownell KD et al. *N Engl J Med* 2009]. Global trends in the total volume of carbonated soft drinks consumed between 2002 and 2007 show a similar pattern [Global soft drinks: Finding value in carbonates. *Euromonitor* 2008].

In China, rising consumption of sugar-sweetened beverages [Kleiman S et al. *Obes Rev* 2012] mirrors an increased incidence of diabetes [Pan XR et al. *Diabetes Care* 1997; Gu D et al. *Diabetologia* 2003; Yang W et al. *N Engl J Med* 2010]. Currently, more than 60% of the world's diabetic population is in Asia [Ramachandran A et al. *World J Diabetes* 2012].

Strong evidence backs claims that sugar-sweetened beverages contribute to weight gain. In an analysis of 3 separate US cohorts that included 120,877 men and women, Mozaffarian et al. [*N Engl J Med* 2011] found that increased daily servings of sugar-sweetened beverages were among the individual dietary components most strongly associated with 4-year weight gain.

Temporal patterns over the past 3 to 4 decades have shown a close parallel between the rise in sugar intake and the incidence of global obesity and type 2 diabetes. These patterns, combined with observational and experimental data, suggest causality between the intake of sugar-sweetened beverages and type 2 diabetes [Malik VS, Hu FB. *Curr Diab Rep* 2012].

Other adverse cardiometabolic conditions have been attributed to consumption of caloric beverages. In the Coronary Artery Risk Development in Young Adults [CARDIA; NCT00005130] study, higher consumption of sugar-sweetened drinks (across quartiles) was associated with increased risk of high waist circumference (p for trend <0.001), cholesterol (p for trend=0.018), triglycerides (p for trend=0.33), and hypertension (p for trend=0.023) [Duffey KJ et al. *Am J Clin Nutr* 2010].