GLOSSARY

CHEMILUMINESCENT ASSAY
An assay that uses light-producing chemical reactions to measure the amount of substance in a solution

increased in recent years. Insulin is known to be a negative regulator of IGFBP-1.

In all, 42 nondiabetic obese children and 42 matched controls participated in the study. Mean fasting serum proinsulin and insulin levels were significantly higher in the obese children than in controls ($P<0.001$), while serum IGFBP-1 levels were significantly lower in the obese group ($P<0.001$). The ratio of proinsulin to insulin did not differ between groups. In both groups, serum proinsulin levels correlated positively with insulin and inversely with IGFBP-1, while serum IGFBP-1 correlated inversely with both BMI and insulin. Regression analysis indicated that BMI and proinsulin were the best predictors of IGFBP-1 levels.

The authors conclude that, in children, fasting proinsulin levels might be a better predictor of the development of type 2 diabetes and of coronary disease than fasting insulin, and that proinsulin is implicated in the negative regulation of IGFBP-1 in obese individuals.

Jim Casey

Original article Kamoda T *et al.* (2006) The serum levels of proinsulin and their relationship with IGFBP-1 in obese children. *Diabetes Obes Metab* **8:** 192–196

Subclinical hyperthyroidism is not associated with adverse outcomes in pregnancy

Among the long-term consequences of subclinical hyperthyroidism is progression to overt hyperthyroidism, which has adverse effects on pregnancy outcomes. To investigate the influence of subclinical hyperthyroidism on pregnancy outcomes, Casey *et al.* used a CHEMILUMINESCENT ASSAY to measure TSH levels in women who delivered a single infant weighing ≥500 g at a Texan hospital over a 2.5 year period.

Of the 25,765 women who were included in the study, 433 (1.7%) had subclinical hyperthyroidism (defined as an endogenous T_4 level of ≤1.75 ng/dl and TSH levels at or below the 2.5th percentile for gestational age).

A greater proportion of African American women had subclinical hyperthyroidism than Hispanic women (3.0% versus 1.6%, $P<0.001$), perhaps because serum human chorionic gonadotropin levels, which are inversely related to TSH levels, are higher in black women than in Hispanic women. Patients with subclinical hyperthyroidism were more likely to have been parous previously than women with normal TSH levels (72% versus 64%, $P<0.001$). None of the adverse pregnancy outcomes measured were associated with subclinical hyperthyroidism. The only significant difference seen between women with subclinical hyperthyroidism and those with normal TSH was the incidence of gestational hypertension, which was significantly lower in the former group (6.0% versus 8.8%, $P=0.04$).

The authors concluded that subclinical hyperthyroidism does not adversely affect pregnancy outcome among women who give birth to a single child.

Chrissie Giles

Original article Casey BM *et al.* (2006) Subclinical hyperthyroidism and pregnancy outcomes. *Obstet Gynecol* **107:** 337–341

Bile acids regulate energy homeostasis via a thyroid-hormone-signaling pathway

As well as having a role in lipid absorption, bile acids can act as endocrine-signaling molecules. With previous studies suggesting that bile acids operate as metabolic integrators, Watanabe *et al.* examined the effects of bile acids on energy expenditure in mice, and in cultured mouse and human cells.

The team found that administering cholic acid—a bile acid—to mice on a high-fat diet increased energy expenditure in brown adipose tissue (BAT), and prevented development of obesity and insulin resistance. These effects were mediated by increased fat oxidation, compared with mice on diets not supplemented with cholic acid. Several genes involved in controlling energy expenditure were upregulated by bile acids in BAT, including that encoding type 2 deiodinase (D2), which activates endogenous T_3 to cause an increase in basal metabolic rate. Human adults do not have significant amounts of BAT, so the team looked at human skeletal muscle—vital for energy homeostasis in humans. In both human muscle cells and mouse brown adipocytes, bile acids increased D2 activity and oxygen consumption by binding to the G-protein-coupled receptor TGR5, causing cyclic AMP levels to rise.