BMI, Poor Diet, and Lack of Exercise Are Driving Diabetes Rates in China

An analysis of type 2 diabetes risk factors suggests that China’s ever-expanding rates of the disease are being driven by increasing BMI, unhealthy diets packed with refined grains, and to some extent low physical activity and high blood pressure. As a result, Li et al. (p. 1685) report that all the modifiable risk factors included in their research can be targeted with policy strategies to prevent diabetes at a population level. China currently accounts for about 100 million diabetes cases—a quarter of the worldwide total. Using data from the China Health and Nutrition Survey, the authors examined the trends of 14 established risk factors for type 2 diabetes between 1991 and 2011 and estimated their likely impact on diabetes burden in terms of the number of cases caused. They also used the data to forecast trends up to 2031 based on the assumption that patterns up to 2011 will continue. The researchers report that increased BMI was the leading individual factor accounting for nearly 44 million cases in the 20-year study period, and low whole grain intake and high refined grain intake (think refined or polished rice) were the leading dietary factors included in the analysis. A range of other factors were also looked at for the millions of cases over the period studied. In short, the Westernization of the Chinese diet would appear to be driving the surge in diabetes cases, particularly after 2000, according to the authors. Projecting the trends to 2031, they suggest millions more cases can be expected if no interventions are made at the population level. Commenting more widely on the article, author Frank B. Hu told Diabetes Care: “Diabetes has become a public health crisis that also threatens to reverse economic gains made in recent decades in China. To curb this epidemic, prevention of chronic diseases such as diabetes through the promotion of a healthy diet and lifestyle should be elevated to a national and global public policy priority.”

Intensive Treatments for Type 1 Diabetes and Cardiovascular Risks: DCCT/EDIC Update

Intensive treatment of type 1 diabetes helps the heart but can also cause unwanted weight gain in some patients. However, more analysis from the Diabetes Control and Complications Trial (DCCT) and the Epidemiology of Diabetes Interventions and Complications (EDIC) studies by Purnell et al. (p. 1756) suggests that after the DCCT stopped, at least initially, intensive glycemic treatment reduced macrovascular events in comparison to conventional diabetes treatments, even when excessive weight gain occurred. The study looked at 1,441 participants from the DCCT by dividing the intensive and conventional treatment groups into quartiles according to observed weight gain during the trial. The researchers then examined the effect of weight gain on cardiac events over the next 20 years via the EDIC follow-up. The group with the greatest gains in weight also experienced increases in cardiovascular risk factors, hypertension medication needs, and increases in lipids compared with the quartiles with lower weight gain and the equivalent quartiles that received conventional therapy. In the entire follow-up period there were reportedly no differences between the groups in the number of major or total cardiovascular events up to 13 years after the end of the DCCT. However, after 14 years the rate of cardiovascular events in the intensively treated group with the highest weight gain did start to increase in comparison to the other groups with less weight gain. The researchers report the rate was eventually the same as the equivalent conventionally treated group. On that basis, they conclude that further follow-up is likely needed to determine whether weight gain combined with intensive treatment for type 1 diabetes leads to major adverse cardiovascular events. According to author Jonathan Q. Purnell: “Intensive diabetes treatment of type 1 diabetes has a beneficial metabolic legacy on cardiac events for many years, even when unwanted weight gain occurs. Even so, our data shows we still need to be constantly vigilant about optimizing management of cardiovascular risk factors in these patients.”
Increased Risk of Insulin Resistance in Adolescent Offspring Exposed to Maternal GDM

Gestational diabetes mellitus (GDM) can cause all sorts of issues for offspring if poorly controlled during pregnancy. However, little is apparently known about its long-term effects on offspring in the adolescent years. According to Grunnet et al. (p. 1746), adolescents born to women who had GDM do show increased adiposity, are likely to have an adverse cardiometabolic profile, and, in females at least, have an earlier onset of puberty. The study involved ~600 children (ages 9–16 years) born to mothers who had GDM and an additional ~600 children born to mothers with no diabetes during pregnancy. Various measures of both body composition and cardiometabolic traits were used to compare the groups via modeling. The authors report that children from mothers who had GDM had higher weight, BMI, waist-to-hip ratio, systolic blood pressure, resting heart rate, and fat percentage but lower height and muscle mass than control subjects. A number of cardiometabolic traits such as glucose and insulin resistance levels also differed between the groups. Even after adjusting for both the BMI of offspring and prepregnancy BMI of the mother, the offspring still had significantly higher glucose levels, insulin resistance, and a raised waist-to-hip ratio in comparison to the healthy control subjects, suggesting the effects of GDM likely persist to adolescence with potential increased risk for the child in terms of diabetes later in life. As a result, the authors conclude that hyperglycemia in pregnancy may be involved in programming body composition in offspring and may be implicated in elevating insulin resistance in adolescents. Author Louise G. Grunnet reflected further on the research: “Our study adds to the mounting evidence of adiposity, insulin resistance, and type 2 diabetes being rooted in pregnancy with hyperglycemia in the mother being one among possibly many adverse etiological factors. To prevent diabetes in future generations, we need to focus on the earliest environment starting even before pregnancy.”

Exercise Reduces Premature Death Risk in Type 1 Diabetes

Exercise and physical activity can result in all sorts of health benefits in both the general population and also individuals with diabetes. And yet, according to Tikkanen-Dolenc et al. (p. 1727) the amount of evidence available on the effects of exercise on type 1 diabetes is apparently limited. To fill the gap, they report their study of the effects of exercise in individuals with type 1 diabetes, revealing that exercise is likely associated with a lower risk of premature all-cause and cardiovascular mortality. The authors also report that physical activity is likely associated with reduced risk of death in individuals with type 1 diabetes and chronic kidney disease (CKD). The study included 2,639 patients with type 1 diabetes and a subset of 310 patients who also had CKD. Mean follow-up time was ~11 years and the primary end point was death from any cause. Additionally, a range of biochemical measurements were used to assess ongoing health, and questionnaires were used to assess physical activity. There were 270 deaths reported in total during the follow-up period, and the levels of physical activity were inversely associated with all-cause mortality as more exercise resulted in lower risk of death. When looking specifically at components of physical activity—intensity, duration, and frequency—only intensity of exercise was associated with lower risk of cardiovascular mortality after adjusting for confounding. In terms of patients with additional CKD, the associations remained but specifically, the total amount and frequency of exercise were the most important factors to consider. The authors conclude: “Exercise is associated with lower risk of premature all-cause and cardiovascular mortality in patients with type 1 diabetes. This study also demonstrates that physical activity is associated with lower risk of mortality also in patients with type 1 diabetes and CKD.”