

## **2007 Global Diabetes Summit Key Research Abstracts**

### **1) Global Diabetes Pandemic in the New Millennium: Threat to Cardiovascular Health and World Economies**

**Plenary Session I, 8:10 a.m.-8:40 a.m., Nov. 30, 2007**

**Pierre Lefévre, MD/PhD, President of the International Diabetes Federation, Belgium**

The International Diabetes Federation estimates that there are close to 250 million people worldwide affected by diabetes. More than 90 percent of these people have type 2 diabetes and half are not diagnosed. Projections indicate an increase of 52 percent at the 2025 horizon, corresponding to some 380 million affected by the condition. Furthermore, in 2006, the number of people with impaired glucose tolerance (IGT) was more than 300 million, with a projected increase to 428 million in 2025. Both diabetes and IGT predispose to premature cardiovascular disease. The devastating effects of diabetes on families translate into significant losses for every individual in the society. The World Bank considers that these consequences will negatively impact the achievement of the Millennium Development Goals. The World Health Organization estimates that between 2005 and 2014 diabetes, heart disease and stroke combined will cost \$556 billion in lost national income in China, \$337 billion in India and \$2.5 billion in a poor country like Tanzania.

**In this plenary session, Dr. Lefebvre will discuss what to do for:**

- those who are recognized to have diabetes
- those who have diabetes, but in whom the condition is not recognized
- those who are at risk of developing diabetes
- the general population

Recent interventions attempting to prevent diabetes will be briefly reviewed, with particular emphasis on the difficulties to modify lifestyle, as generally recommended. The strategy of the International Diabetes Federation against the current epidemics will be summarized.

### **2) Childhood and Youth Type 2 Diabetes Mellitus: The Evolving Picture**

**Symposium III, 8:40 a.m.-9:10 a.m., Nov. 30, 2007**

**Silva Arslanian MD, Richard L. Day Professor of Pediatrics, University of Pittsburgh,  
School of Medicine**

Historically, type 2 diabetes mellitus (T2DM) has been considered a disease of adults and older individuals and not a pediatric condition. However, during the last decade there has been an alarming trend of increasing cases of youth T2DM in the U.S. and rest of the world. This increase has paralleled the escalating rates of childhood obesity. The clinical characteristics of T2DM in children are: 1) obesity and increased body mass index; 2) family history of T2DM; 3) preponderance of American-Indian, African-American and Latino children; 4) mean age at diagnosis of 13.5 years with the majority of patients in mid-puberty; 5) increased female-to-male ratio; 6) acanthosis nigricans; and 7) conditions associated with insulin resistance e.g. polycystic ovary syndrome. These clinical characteristics all include insulin resistance, which is the earliest abnormality in the course of events leading to T2DM. The pathophysiology of T2DM in youth includes extreme degrees of insulin resistance combined with variable degrees of impairment in cell function. The clinical presentation of youth T2DM varies from asymptomatic incidental

diagnosis to severe symptoms including ketoacidosis or hyperglycemic hyperosmolar non ketotic coma. Against the backdrop of the obesity trajectory in the general population as well as children with type 1 diabetes, the distinction between autoimmune type 1 diabetes in an obese child vs. pure T2DM is a difficult task even among the most experienced. Data will be presented in regards to the pathophysiology of youth T2DM and how the presence or absence of pancreatic autoantibodies impacts cell function and clinical characteristics in these children.

### **3) Global Cardiovascular Pandemic: the role of obesity and modern lifestyle**

**Special Evening Program, 7:30 pm-8 pm, Nov. 30**

**Dr Sandeep Gupta, MD FRCP, Consultant Cardiologist, Whipps Cross and St Bartholomew's Hospitals, United Kingdom**

In a world population of more than 6 billion people, it is estimated there are an equal number of people who are overweight and obese to those who are hungry and malnourished; the world is split into two, and often these 2 groups are neighbors. Globally, more than 17 million deaths a year are blamed on cardiovascular diseases (CVD); 80 percent being from emerging economies and developing countries. Some 20 million people a year survive a heart attack or a stroke.

With alarming rates of child and teenage obesity, the diabetes epidemic and associated cardiovascular diseases is no longer projected, but the current health situation. A diagnosis of type II diabetes increases CVD risk 2-3 times and lifespan shortened by about 10 years. No one seems immune from these diseases with African cities, the Gulf region and most countries in Asia rapidly contributing to the burden of diabetes, hypertension, coronary disease and stroke. Countries in the developed world and Eastern Europe already have CVD as the number one killer.

The obesity debate is active – messages of a healthy diet and regular physical activity are global – but more needs to be done. One wonders whether legislation, enforcement and rewards for targeting CVD risk factors are the best hope for a U-turn in this trend. At the Global Diabetes Summit in Columbus, Ohio, I will be delivering the stark reminders of the current and projected health statistics and contribute to the vocal public message of the current dangers and risk factors of the cardiovascular pandemic such as an unhealthy diet, cigarette smoking and a lack of exercise.

As a reminder for Americans:

58 Million Overweight; 40 Million Obese; 3 Million morbidly Obese

Eight out of 10 over 25's Overweight

78% of American's not meeting basic activity level recommendations

25% completely Sedentary

76% increase in Type II diabetes in adults 30-40 yrs old since 1990

Around 35 adults died in the last hour, directly related to obesity

#### **4) Current Concepts in Gestational Diabetes: The Role of Placental Adipose Cytokines**

**Workshop IIC, 4 p.m.-4:30 p.m., Dec. 1, 2007**

**Patrick Catalano, MD, Chairperson, Department of Obstetrics and Gynecology,  
MetroHealth Medical Center, Case Western Reserve University; Professor, Department  
of Reproductive Biology, Case Western Reserve University, Cleveland**

Cytokines are small secreted proteins which mediate and regulate various functions including inflammation and cell signaling. The placenta is a source of multiple cytokines during pregnancy that may affect maternal metabolism. Leptin is produced in large quantities in the placenta and increases in early gestation prior to significant increases in maternal adipose tissue. Cord leptin is most strongly related to neonatal adiposity, and neonatal fat is also a source of leptin. Lastly, increases in maternal leptin concentrations are related to increased maternal fat oxidation, particularly in late gestation, supplying increased energy needs for the mother. TNF $\alpha$  is another cytokine, made in both the placenta as well as adipose tissue/monocytes. TNF $\alpha$  concentrations are negatively correlated with changes in insulin resistance during pregnancy affecting post-receptor signaling cascade in muscle tissue. However, intramyocellular lipid may be the source of TNF $\alpha$  effecting pregnancy insulin resistance. Lastly, there is controversy whether adiponectin is made in the placenta or exclusively in adipose tissue. Adiponectin is the most abundant adipocytes identified to date (mg qualities). In late pregnancy, plasma adiponectin concentrations are decreased. The changes in plasma adiponectin reflect changes related to peripheral insulin sensitivity rather than maternal hepatic or lipid metabolism. In summary, cytokines/adipokines, whether from placental or maternal origins, play a significant role in the alterations in maternal metabolism in normal pregnancy.

#### **5) The Future of Endocannabinoids in Cardiovascular Diseases: Will they Become a Reality?**

**Dinner Symposium, 8 p.m.-8:30 p.m., Dec. 1**

**Xavier Pi-Sunyer, MD, MD, MPH, Professor of Medicine at Columbia University College  
of Physicians and Surgeons and Professor of Applied Physiology at Columbia Teachers  
College, New York City**

The newly discovered endocannabinoid system provides a treatment target for high-risk obese patients. Ph 3 studies (in over 6,000 overweight/obese subjects) have investigated the effectiveness of a CB1 receptor blocker, rimonabant, on body weight and metabolic risk factors. Studies were in non-diabetic and type 2 diabetic patients and in obese patients with dyslipidemia. Rimonabant (R) induced a significant reduction in body weight and waist circumference. Plasma triglycerides, HDL-cholesterol, fasting glucose and insulin were improved. During the second year, weight and waist circumference were maintained, while the rise in HDL-cholesterol and the drop in triglycerides were augmented. Adverse events (AE) were reported in 5.9 percent of patients on R compared to 4.2 percent on placebo. The dropouts were 13.8 percent vs. 7.2 percent in the first year. The AEs leading to withdrawals included psychiatric, nervous system, and gastrointestinal events. Mood changes and anxiety were somewhat higher in the R group than in placebo. R has been approved in more than 40 countries, but not in the U.S. The drug should not be used in patients with serious psychiatric illness or in patients taking antidepressants.