

The Double Epidemics of Pre-Diabetes and Diabetes

By Nicoleta Ionica, M.D. and Sam Dagogo-Jack, M.D.

Pre-Diabetes Research Unit, Division of Endocrinology, Diabetes and Metabolism
University of Tennessee Health Science Center, Memphis, TN

The scope of the problem

Diabetes (high blood sugar) is a public health problem, accounting for the majority of patients with, end-stage renal failure, adult-onset of blindness, and cardiovascular morbidity and mortality. There is now abundant evidence that type 2 diabetes, which accounts for greater than 90% of diabetes world-wide, is preventable. Moreover, the complications of diabetes are preventable by a policy of tight glycemic control and comprehensive risk reduction. Even after complications have set in, intensive glucose control dramatically reduces the risk of progression of complications. Diabetes now affects nearly 21 million Americans – or 7 percent of the U.S. population – and more than 6 million of those people do not know they have diabetes, according to the latest prevalence data released by the Centers for Disease Control and Prevention (CDC).

Even worse, some 54 million people in America have *pre-diabetes*, a condition that increases the risk of developing type 2 diabetes, heart disease and stroke. Both the incidence and prevalence of diabetes are increasing worldwide. From 1980 through 2005, the number of Americans with diabetes increased from 5.6 million to 15.8 million. Americans Indians, African Americans, and Hispanics are about two times more likely than whites to have diabetes.

The human and economic toll

Beside the human toll, the economic burden of diabetes is staggering. The United States spends approximately \$132 billion each year on diabetes. The increasing prevalence of diabetes is particularly marked in the southeastern region of the U.S., which appears to be the epicenter of the diabetes epidemic.



Dr. Ionica (right) and Dr. Dagogo-Jack (left) during an indirect calorimetry, test used to determine resting energy expenditure. This test enables calculation of

glucose disposal in the body.

For instance, in Tennessee, approximately 206,042 adults (5.1 % of the population) had a diagnosis of diabetes in 1997. Statewide health statistics analyzed in 1997 indicated a considerable burden of diabetes-related complications in Tennessee: There was 74,616 diabetes-related hospitalizations (including 23,583 admissions for cardiovascular disease), 315 new cases of blindness, 654 new cases of end-stage renal failure, and 1,441 lower extremity amputations. Furthermore, diabetes contributed to 4,054 deaths and accounted for a total health care expenditure of 2.7 billion in the state of Tennessee.

Most cases of diabetes fall into one of two categories, although overlap may occur and the distinction may not always be clear. Type-1 diabetes, called previously insulin-dependent diabetes mellitus (IDDM), accounts for < 10% of all cases of diabetes, tends to occur in younger subjects and is caused by severe insulin deficiency. Type-2 diabetes, called previously non-insulin-dependent diabetes mellitus (NIDDM), accounts

for about 90% to 95% of all diagnosed diabetes and is usually seen in older adults but is being diagnosed with increased frequency in younger age groups, including children and adolescents.

Recognizing and managing pre-diabetes

Long before people develop type 2 diabetes, they pass through a stage of “pre-diabetes”, indicated by blood glucose levels that are higher than normal but not yet high enough to be diagnosed as diabetes. The term was first introduced in 2002 by the Department of Health and Human Services (DHHS) and the American Diabetes Association (ADA). One of the reasons for emphasizing pre-diabetes in

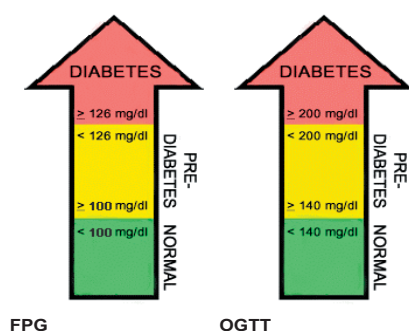
current medical discussion is to highlight the seriousness of the condition, and to motivate people to get appropriate advice as early as possible. With early intervention and lifestyle adjustments, pre-diabetes can be prevented from progressing to full-blown diabetes. Even better, with such lifestyle adjustments in dietary and physical activity habits, many pre-diabetic persons return back to a perfectly normal glucose state.

Clearly, pre-diabetes is a condition that raises the risk of developing type 2 diabetes, heart disease and stroke, yet many individuals are not routinely tested for pre-diabetes. People with pre-diabetes have impaired fasting

Midsouth Wellness Guide

glucose (IFG) and/or impaired glucose tolerance (IGT). Within 5-10 years, most people with pre-diabetes will have progressed to diabetes. Pre-diabetes is diagnosed with one of two blood tests—a fasting plasma glucose test or a two-hour oral glucose tolerance test (OGTT). The fasting plasma glucose test requires an eight-hour fast (no food or drink except water), after which a blood draw is performed. It is usually done in the morning. For an oral glucose tolerance test, a patient is given a drink of 75 grams of glucose, and a blood draw is taken two hours later.

The table below shows the ADA practice diagnostic guidelines:



If testing is positive for pre-diabetes, a follow up test should be performed on a subsequent day to confirm the diagnosis. People with diagnosed pre-diabetes should receive regular retesting every one to two years to monitor for type-2 diabetes. Individuals with a normal screening result can be retested every three years.

The risk factors identified for pre-diabetes overlap with those for type 2 diabetes. They include obesity, family history, low HDL cholesterol and high triglycerides, high blood pressure, history of gestational diabetes and ethnicity. Progression to diabetes among those with pre-diabetes is not inevitable. Research has also shown that if you take action to manage your blood glucose when you have pre-diabetes, you can delay or prevent type 2 diabetes from ever developing. According to the American Diabetes Association, some studies show that most people with prediabetes go on to develop type 2 diabetes within 10 years unless they make lifestyle changes -- diet and exercise -- to reduce the risk of diabetes.

Diabetes forces you to examine your eating and exercise habits and tunes you into your body's signal and response system. It requires a commitment to regular preventative care and for some it is a great motivator for positive health changes like losing excess weight and quitting smoking. Good diabetes management also becomes a lifestyle choice. Seemingly simple tasks like eating meals, going for a walk or bike ride, driving your car,

and going away for the weekend will take extra preparation and planning. The good news is that it's hard work that pays off – even minor lifestyle improvements, such as adding 20-30 minutes of exercise to your daily routine, can have a major impact on blood sugar levels and the risk of diabetic complications.



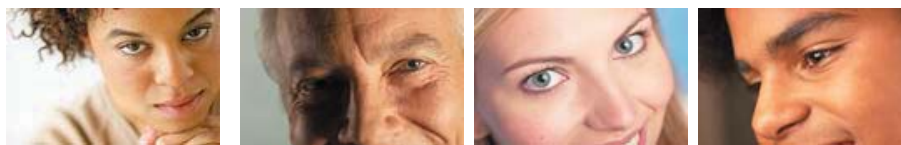
About The Authors

Nicoleta Ionica M.D., Dr. Ionica earned her medical degree at “Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania. She completed her residency in Internal Medicine at Norwalk Hospital affiliated with Yale University School of Medicine. Currently she works as a research fellow at University of Tennessee Health Science Center for the Division of Endocrinology, Diabetes and Metabolism studying the pathobiology of ethnic disparities in diabetes and pre-diabetes. For any additional information or to make an appointment to be screened for

pre-diabetes contact her at (901) 448-5299 or nionica@utmem.edu

Sam Dagogo-Jack M.D., Dr. Dagogo-Jack earned his medical degree from the University of Ibadan Medical School in Nigeria, completed residency in Internal Medicine at the Royal Victoria Infirmary, University of Newcastle, UK, and underwent fellowship training in Endocrinology, Diabetes and Metabolism at Washington University School of Medicine, St Louis, MO. Dr Dagogo-Jack served on the faculty at Washington University School of Medicine and held the positions of Professor of Medicine and Director, Diabetes Program at the University Medical Center, Jackson, MS, before taking up his current position. Program Director for Division of Endocrinology, Diabetes and Metabolism he is also Associate Director at General Clinical Research Center of University of Tennessee Health Science Center. For more information regarding screening for pre-diabetes at (901) 448-5299 or sdi@utmem.edu

Volunteers Wanted for Pre-Diabetes Research Study



UT Researchers are looking for volunteers to join a Pre-diabetes Research Study. Pre-diabetes is a condition in which blood sugar is higher than normal but not yet diabetic.

Study Aims:

The aim of this research study is to understand the factors that lead to prediabetes in healthy persons whose parents have diabetes.

What is Involved?:

- Free screening for pre-diabetes
- Free follow-up tests every 3 months for 5 years
- Patient will receive an incentive fee for participation
- Patient will not incur any medication or lab-work cost

Study Criteria:

You may qualify for the Pre-Diabetes Research Study if:

- You are an African-American or a Caucasian (male or female) aged between 18 years to 65 years.
- You do not have diabetes but have one or both parents with diabetes.
- You do not plan to leave the Memphis area within the next 5 years.

For more information, please call: 901- 448-5299
University of Tennessee Health Science Center