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The Issue of Our Age: Hyperinsulinemia and Metabolic Disease

This month begins a three-part series that will focus on type 2 diabetes, insulin resistance, glucose management, and metabolic disease. The route to a diagnosis of metabolic disease may vary from person to person, and likewise there are varying degrees of concern related to this spectrum of disorders. What is a clinician to do when patients of different sizes, shapes, and body chemistry present themselves for treatment? The right treatment for one person may not be the best approach for another. How should decisions be made? In this issue, Dr. Bland interviews Dr. Philip Kern, a practicing endocrinologist who studies questions like this every day.

Twenty years ago, type 2 diabetes was practically unheard of in China. In the United States, this condition was referred to as "adult onset diabetes," because it was almost exclusively seen in older-age people. Obviously, times have changed. China, along with other developing nations, has seen a dramatic increase in the prevalence of hyperinsulinemia-driven disease. And pediatricians and family practitioners now regularly manage young patients with type 2 diabetes. As background for his discussion with Dr. Kern, Dr. Bland briefly describes some of the biochemical processes involved in glucose management, and quotes from recent articles in the medical literature that document the rise in prevalence and explore some of the underlying genetic causes that may be involved. REF #1-3

Clinician/Researcher of the Month

Philip Kern, MD
Professor, Division of Endocrinology and Molecular Medicine
Director, Barnstable Brown Diabetes and Obesity Center
Director, Center for Clinical and Translational Sciences
University of Kentucky
521A Charles T. Werthington Building
900 South Limestone
Lexington, KY 40536

Dr. Philip Kern is a practicing endocrinologist and an active researcher who focuses on obesity, diabetes, and metabolic syndrome. Based at the University of Kentucky in Lexington, Dr. Kern is a professor in the Division of Endocrinology and also Director of both the Barnstable Brown Diabetes and Obesity Center and the Center for Clinical and Translational Sciences. With his colleagues, Dr. Kern examines adipose tissue and muscle gene expression in relation to insulin resistance.

Dr. Bland and Dr. Kern begin their discussion with a focus on two topics that are widely researched and complex in terms of determining their relationship to diabetes: genetics and obesity. Dr. Kern comments

on the myriad conditions that can result from obesity, and he discusses the relationship between glycemic control and cardiovascular disease. When it comes to treating type 2 diabetic patients, Dr. Kern maintains that the main reason to improve glycemic control is to prevent nephropathy, retinopathy, and neuropathy. However, when the goal is to reduce the likelihood of coronary disease, then one needs to focus on lipids, hypertension, and other cardiac risk factors because glycemic control by itself is probably not going to be a strong means of reducing coronary risk.

Dr. Bland and Dr. Kern talk about the use of analytes and biomarkers in clinical practice. As an active clinician, Dr. Kern acknowledges the challenge of personalizing the right program based on the background and biochemistry of individual patients. Several examples are given.

The conversation shifts to emerging research. Dr. Kern provides his insights on work being done in the field of Alzheimer's and the concept of "type 3" diabetes, which connects insulin resistance to dementia. He explains why he believes insulin resistance in nerve cells is a very different phenomenon than insulin resistance skeletal muscle that is found in type 2 diabetes. Dr. Bland asks Dr. Kern about the normalization of metabolic parameters that has been seen in some patients following gastric bypass surgery and Dr. Kern weighs in on this emerging research as well. His experience directing clinical metabolic weight-loss programs provides Dr. Kern with a unique perspective.

The interview moves to a discussion of a very new area of research: adipocyte physiology. Researchers are now examining the make-up and function of white, beige, and brown fat, which is directly related to mitochondria bioenergetics. Dr. Kern is actively following this research and comments on the relationship between mitochondrial function in muscle and insulin sensitivity. The interview concludes with a focus on Dr. Kern's own studies involving omega-3 fatty acids. REF #4-6

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