

Lens Fluorescence an Indicator of Metabolic Control in Type 1 Diabetes

The rate of fluorophore accumulation in the lens of the eye in patients with type 1 diabetes is increased in proportion to glycemic control, researchers reported.

"This parameter alone is, however, not sufficient to explain the entire variation in lens fluorophore accumulation," researchers wrote in the *British Journal of Ophthalmology*. They reported that lens fluorescence must be influenced by other factors that occur even before onset of diabetes mellitus. "The underlying mechanism could be a variation in susceptibility to lens protein denaturation by glycation," wrote Line Kessel, MD, and colleagues from Herlev Hospital in Copenhagen.

The researchers followed the post-translational modification of the proteins of the lens of the eye by fluorometry over 14 years in 20 patients with type 1 diabetes.

They found that follow-up lens fluorescence was significantly related to mean HbA1c during the study period and to lens fluorescence at baseline ($P < .0001$). They reported that 60% of the variation in rate of increase in lens fluorescence during the study period was statistically attributable to glycemia levels. The investigators believe that genetic susceptibility to tissue damage by glycation also plays a role.

New Understanding of Diabetic Retinopathy

Ophthalmologists reported 13 distinct patterns in color vision impairment caused by diabetic retinopathy (DR). To classify and describe clinically meaningful classes of color vision defects, researchers used pretreatment Farnsworth-Munsell 100-hue results from 2,701 patients in the Early Treatment Diabetic Retinopathy Study (ETDRS). The results were published in the *American Journal of Ophthalmology*.

Researchers reported that about 26% of the ETDRS patients showed a hue discrimination defect. ETDRS was a randomized trial investigating retinal photocoagulation and oral aspirin in DR. DR, the leading cause of acquired blindness, can occur at any time following the onset of diabetes and is preventable with prompt detection and proper treatment.

DME Impairs Vision When Central Macula Involved

The closer diabetic macular edema (DME) gets to the center of the macula, the more likely it is to impair vision. Researchers reported that while vision loss results from

retinal thickening involving the center of the macula, few data are available qualifying this finding.

The investigators analyzed data from 939 patients with various levels of DME who were participating in two clinical trials of ruboxistaurin (Eli Lilly and Company). They found that visual acuity did not decline until the center of the macula was affected by retinal thickening. Furthermore, 33% of patients with retinal thickening $>500 \mu\text{m}$ from the macular center eventually developed center thickening.

Microalbuminuria Reliable Marker of Retinopathy in Type 2 Diabetes

Among type 2 diabetes patients, microalbuminuria is associated with DR. According to research published in *BioMed Central Ophthalmology*, microalbuminuria is a reliable marker of retinopathy.

In a cross-sectional study of 590 patients with type 2 diabetes, the overall presence of retinopathy was 39.3%. The prevalence of microalbuminuria was 25.9% and 14.5% of patients had macroalbuminuria. The researchers stated that, as expected, DR and renal involvement were highly correlated ($P = .001$).

Caffeine Impairs Glucose Metabolism in Diabetic Patients



James D. Lane

Caffeine intake at mealtime increased glucose and insulin levels among patients with type 2 diabetes. In a small study, Duke University researchers concluded that patients who consume caffeine regularly may have a harder time regulating insulin and glucose levels than those who do not take caffeine.

James D. Lane, PhD, associate research professor in the department of psychiatry and behavioral study, is lead author of the study. He and his team examined how oral caffeine capsules affected the metabolism of carbohydrates in patients with type 2 diabetes. They found that while caffeine did not affect fasting levels of blood glucose or insulin, significant changes in both were seen postprandially. Fourteen habitual coffee drinkers were included in the double-blind study. Patients had at least a 6-month history of diabetes and did not require insulin.

Researchers reported in *Diabetes Care* that patients who consume caffeine and struggle to maintain glucose levels should consider reducing their caffeine intake.

Risperidone Linked to Hyperglycemia, Diabetes

The FDA has notified health care providers of revisions to the warnings section of drug labeling for risperidone (Risperdal, Janssen) and ziprasidone (Geodon, Pfizer). According to an alert from MedWatch, the warning refers to the increased risk of hyperglycemia and diabetes in patients treated with risperidone, ziprasidone and other atypical antipsychotics.

The FDA has received reports of hyperglycemia, in some cases extreme and associated with ketoacidosis, in patients treated with these medications. Some cases of hyperglycemia have resolved upon discontinuation of the drug, while others have required continued antidiabetic treatment.

The link between atypical antipsychotic use and hyperglycemia-related adverse events may be confounded by possible increased risk of diabetes in the schizophrenic population and increasing incidence in the general population, according to the letter. However, epidemiologic studies suggest an increased risk of transient-emergent

hyperglycemia-related events in these patients.

The FDA recommends that all patients treated with atypical antipsychotics be monitored for symptoms of hyperglycemia and undergo fasting blood glucose testing upon presentation. Patients diagnosed with diabetes should be monitored regularly for loss of glucose control. Patients with traditional diabetes risk factors should undergo fasting blood glucose testing at initiation of treatment with atypical antipsychotics. For more information, visit www.fda.gov/MedWatch.

Unimpressive Results with Pharmacotherapy for Weight Loss in Diabetic Patients

While adults with type 2 diabetes taking fluoxetine, orlistat or sibutramine did have statistically significant weight loss over 26 to 52 weeks, the magnitude was modest and the long-term health benefits and safety remain unclear.

Investigators reporting in the *Archives of Internal Medicine* note that obesity is closely tied to type 2 diabetes and weight reduction is an important part of treatment. They conducted a systematic review of the literature to assess the efficacy of pharmacotherapy for weight loss in these patients. Included were 14 randomized, placebo-controlled trials with a total 2,231 patients.

Researchers concluded that interventions combining pharmacologic treatment and intensive behavioral interventions may be more effective for achieving significant and long-term weight loss.

American-Indians, Native Alaskans at Increased Risk for Diabetes

American-Indians and Alaska Natives are 2.3 times as likely to have type 2 diabetes as non-Hispanic whites of similar ages. In response, the National Diabetes Education Program (NDEP) has launched a public awareness campaign called "We Have the Power to Prevent Diabetes."

The purpose of the campaign is to promote the message that these groups can fight diabetes in their communities by taking step to lose a modest amount of weight by increasing activity levels, eating less and making healthier food choices.

The program is part of the NDEP's, "Small Steps. Big Rewards. Prevent Type 2 Diabetes" campaign, which targets groups at the highest risk for diabetes. "Diabetes is a growing epidemic in our communities, especially for high-risk groups," said Elias A. Zerhouni, MD, director of the National Institutes of Health. "If we are going to make a difference, we need to reach people where they live, work and play, with information that is consumer-friendly and practical based on the proven science of diabetes prevention. Our goal is to empower those at high risk for type 2 diabetes to take steps to prevent this devastating disease." For more information, visit ndep.nih.gov.

Sugar-Sweetened Beverages Linked to Weight Gain, Type 2 Diabetes in Women

Higher consumption of beverages sweetened with sugar is associated with a greater increase in weight gain and an increased risk for development of type 2 diabetes in women.

Researchers reporting in the *Journal of the American*

Medical Association said that the link may be due to the excessive calories and large amounts of readily absorbable sugars in beverages such as soft drinks and fruit punch. To examine the association, Matthias B. Schulze, DrPH, and associates used prospective cohort analyses from the Nurse's Health Study II.

The diabetes analysis was obtained from 91,249 women who were free of diabetes and other major chronic disease at baseline in 1991. The analysis of weight change was obtained from 51,603 women for whom complete dietary information and body weight were reported in 1991, 1995 and 1991. "We identified 741 incident cases of confirmed type 2 diabetes during 716,300 person-years of follow-up," they reported.

Women who had stable consumption patterns had no difference in weight gain. However, those who increased their intake of sugar-sweetened drinks from one or fewer per week to one or more per day, over a 4-year period, had the highest weight gain. Women who decreased their intake of these beverage had the smallest weight change. This outcome was found after adjusting for lifestyle and dietary confounders.

After adjustment, women consuming one or more sugar-sweetened soft drinks per day had a relative risk of type 2 diabetes of 1.83 versus those who consumed fewer than one of these beverages per month ($P<.001$). Fruit punch consumption was associated with a similar increased risk.

"Public health strategies to prevent obesity and type 2 diabetes should focus on reducing sugar-sweetened beverage consumption," Schulze and colleagues wrote.

Diabetes Following Kidney Transplant More Common

More patients appear to be developing diabetes for the first time after kidney transplant, increasing the risk of transplant complications and death, according to a report in the *American Journal of Kidney Disease*.

People who have pre-existing diabetes are better off having transplant surgery before they develop kidney failure, the study found, suggesting that physicians should offer transplantation as an option to diabetics sooner, rather than later.

Because of the epidemic proportions of diabetes, the rate of kidney failure has doubled over the last decade, with even higher numbers among minority patients, the report noted. More than 20% of all kidney transplant recipients have diabetes.

Exercise, Weight Loss May be Key to Diabetes Prevention in Overweight Women

Body mass index (BMI) is a stronger predictor of type 2 diabetes than level of physical activity.

Researchers from Brigham and Women's Hospital published findings from the Women's Health Study in the *Journal of the American Medical Association*. The study found that while frequent exercise reduces the risk of diabetes, this is greatly overshadowed by the elevated risk of diabetes from being overweight or obese. These results suggest that physical activity accompanied by weight loss, rather than physical activity alone, may be the better strategy for diabetes prevention in middle-aged and older women.

"Many women who exercise regularly believe that they are protected from diabetes, even though they remain at an unhealthy weight," said lead investigator Amy Weinstein, MD, MPH, in a news release. "However, our study suggests that physical activity does little to counter a woman's risk of developing diabetes if she has a [BMI] considered overweight or obese. Therefore, the key to diabetes prevention in these women may be to achieve a healthy weight, and exercise remains an important part of this process."

For an average of almost 7 years, women in the Women's Health Study, aged 45 years and older, reported their BMI and weekly activity levels, including time spent walking. Women were divided into groups based on both their BMI and physical activity level. Of the 37,878 women enrolled in the study, 1,361 went on to develop type 2 diabetes.

BMI was more strongly associated with the risk of type 2 diabetes than physical activity. For example:

- A four-fold increased risk of diabetes for overweight women and a 12-fold increased risk of diabetes for obese women was only modestly reduced when these women were physically active.

- Overweight and obese women walking ≥ 4 hours per week still experienced corresponding four and 11-fold increases in the risk of developing diabetes compared with women walking as often, but in the normal weight group.

"This study highlights the critical role fat tissue likely plays in triggering the onset of type 2 diabetes and it is becoming more clear that weight dominates exercise as the prime risk factor patients can control to reduce their risk," said Michael Gaziano, MD, MPH, chief of the

Division of Aging at Brigham and Women's Hospital and senior author. "We cannot lose sight, however, of exercise's many proven benefits for diabetes and other chronic diseases, especially in helping women lower and maintain healthy weight. Our study suggests that loss of even a few pounds can dramatically reduce an overweight or obese woman's risk of diabetes. While further testing in clinical trials will confirm our hypothesis, in now appears that physicians should emphasize exercise in combination with weight loss to achieve a healthy BMI and reduce diabetes risk."

More Frequent Monitoring Advised for Diabetic Patients

Patients with type 1 and type 2 diabetes should monitor their blood sugar levels more than the usual two times daily to make sure that levels are not elevated >150 mg/dL for sustained periods.

Researchers at The Johns Hopkins University School of Medicine have reported additional detailed evidence of the link between elevated blood sugar levels in patients with diabetes and increased risk of cardiovascular disease (CVD).

Their findings, part of a broad retrospective meta-analysis published in the *Annals of Internal Medicine*, suggest long-term monitoring of HbA1c and add it to regular monitoring of cholesterol levels and blood pressure.

"The relationship between glycemic control in people with diabetes and whether this increases their risk of developing heart disease has remained unclear until now, despite many different studies about specific types of cardiovascular problems," said the study's senior author, endocrinologist Sherita Golden, MD, MHS, assistant professor of medicine and epidemiology, at Johns Hopkins and Bloomberg School of Public Health.

In a news release, Golden said: "People living with diabetes are twice as likely to die from [CVD] compared to those without diabetes. As a result, many people living with diabetes monitor their health for well-known risk factors for heart disease, such as obesity, cholesterol levels and blood pressure — but, the big unknown has been the role of blood sugar levels in managing their risk of developing [CVD]."

The investigators pooled and re-analyzed data from 13 previously published studies involving nearly 10,000 people from North America and Europe with type 1 or type 2 diabetes. ■