

Diabetic Retinopathy, Nephropathy Related in Patients with Type 1 Diabetes

Investigators studying the association between diabetic retinopathy (DR) and diabetic nephropathy found that preclinical morphologic changes in nephropathy were associated with the severity of DR.

Published in *Diabetes*, the study enrolled 285 type 1 diabetic patients from the Renin-Angiotensin System Study (RASS) who were normoalbuminuric. All patients were aged ≥ 16 years, had normal renal function at baseline and were tested for DR with the Early Treatment

Diabetic Retinopathy Study severity scale. Investigators noted that 36% of patients did not show signs of DR.

Fifty-three percent had mild and 9% had moderate to severe nonproliferative DR. Proliferative DR (PDR) was present in only 2% of patients.

As the severity of DR increased, so did preclinical changes of diabetic nephropathy. These changes included renal structure parameters and the width of the glomerular basement membrane.

Aqueous Humor, Vitreous Levels Related in DR Patients

Vascular endothelial growth factor (VEGF) and interleukin-6 (IL-6) levels in the aqueous humor and in vitreous fluid are significantly related and may predict the activity of DR.

Investigators reporting in *Graef's Archive for Clinical and Experimental Ophthalmology* wrote that measurements of these levels may also help analyze the pathogenesis of this diabetes complication.

Cataract and vitreous surgery procedures from 10 patients with diabetic macular edema and 26 patients with PDR produced samples of aqueous humor and vitreous fluid.

Investigators used enzyme-linked immunosorbent assay to study the VEGF and IL-6 levels in the aqueous humor, vitreous fluid and plasma.

They found that in the aqueous humor, the levels of VEGF and IL-6 were significantly correlated to those in the vitreous fluid ($r = .659$ and $r = .737$, respectively). They also found a significant correlation between DR severity and IL-6 aqueous and vitreous levels ($r = .742$ and $r = .746$, respectively). These levels were higher in patients with active PDR versus those with quiescent PDR, the investigators wrote.

Cataract Surgery Controversial in Diabetic Patients

According to investigators reporting in *Comprehensive Ophthalmology Update*, the use of cataract surgery in

patients with either diabetes or age-related macular degeneration (AMD) is still controversial.

Cataract surgery is one of the most common surgical procedures, however, it is yet to be determined if it is an effective treatment for disease progression. Investigators studied published materials regarding surgeries in these populations, and completed an update of guidelines that may be used in the treatment of cataracts stemming from retinal diseases such as DR and AMD. They noted that cataract surgery procedure is regularly performed in patients with diabetes or AMD.

Although phacoemulsification has caused an improvement in surgical outcomes, investigators noted that there are new approaches that may have greater benefit in improving vision. *See a related article on page 35.*

ALC Regenerates Nerves, Improves Pain

When used in 500- and 1,000-mg doses, Acetyl-L-carnitine (ALC) alleviates the symptoms of diabetic peripheral neuropathy.

Patients who received the treatment had less pain and improved nerve fiber regeneration versus patients who received placebo. Treated patients also experienced an improvement in vibration detection threshold (VDT), according to investigators reporting in *Diabetes Care*.

Data from two 1-year placebo-controlled trials were evaluated. Investigators noted an intention-to-treat in 1,257 patients and studied levels from each trial separately. They

noted sural nerve morphometry, nerve conduction velocities, VDT and clinical symptom scores.

They also analyzed visual analog scores for pain symptoms. According to investigators, the sural nerve fibers and nerve fiber clusters showed significant improvements.

Tight Blood Pressure Control Delayed ED in Type 1 Men

Men diagnosed with type 1 diabetes early in life and control their blood pressure tightly may be less likely to have erectile dysfunction (ED).

According to a population-based cohort, smoking cessation also helped prevent or delay the onset of ED in 75% of patients enrolled in the study. Reporting in the *Journal of Diabetes and its Complications*, investigators studied the cumulative incidence of ED in 264 patients, aged ≥ 21 to 30 years and diabetes duration ≥ 10 years. All patients took insulin.

Although 25% of patients developed ED after 10 years, 48.6% aged ≥ 40 years developed the dysfunction. ED developed in 10.2% of patients aged 21 to 29 years ($P < .0001$ for both), suggesting that the incidence of ED increases with age, investigators wrote. Diabetes duration also affected ED, as it was found in 38.2% of patients who had diabetes for ≥ 25 years and 16% who had diabetes for 11 to 14 years ($P = .01$).

"In multivariate analyses, incidence of [ED] was associated with age [odds ratio (OR) 1.10, 95% CI, 1.06, 1.14], untreated hypertension (OR 5.01, 95% CI, 2.05, 12.27), and history of smoking (OR 2.41, 95% CI, 1.09, 5.30) at baseline," they wrote.

Guidelines Can Improve Diabetic Foot Care

Investigators of a multidisciplinary, evidence-based, assessment of acute diabetes related foot complications suggested that clinical guideline assessments may help health care professionals make informed decisions.

Reporting in *Diabetic Medicine*, investigators studied 266 pieces of published and unpublished literature on diabetes related foot complications and created a comprehensive clinical guideline document to assess, investigate and manage foot complications in patients with acute diabetes. They noted that 47% of the documents they studied used sound and clinically relevant methodological assessments.

The new guidelines, written by a multidisciplinary expert

group, include a diabetes-specific classification system that codes the severity of causative factors such as neuropathy, vascular compromise, ulceration and infection. This classification system is used for coding the causative factors for presence/absence in acute diabetic patients who are developing related foot complications. Using such a system "may benefit the individual and health system through reductions in amputation rate, length of hospital stay and health expenditure," they wrote.

Farm-to-School Programs Help Improve Kids' Diets

Children will eat fresh fruits and vegetables when a variety are available, according to a study performed at the University of California.

Gail Feenstra, food systems analyst at the UC Davis Sustainable Agriculture Research and Education Program, and colleagues said that children choose fruits and vegetables when they are offered in variety and are fresh. Over 850 digital images of elementary students' lunches from farm-to-school salad bar programs showed children's food selections including strawberries, cherries, melons and grapes. Vegetable selections included carrots, lettuce mix, red bell peppers and cherry tomatoes.



Photo courtesy of University of California Sustainable Agriculture Research & Education Program

The Davis Joint Unified School District began implementing farm-to-school salad bar programs in 2001, and now school districts across the United States have adopted the salad bar programs. "As programs appear, we often hear the claim that children will reject fresh produce," Feenstra said in a news release. "We saw that children are taking more fruits and vegetables with a salad bar model."

The program makes sure that cafeterias are stocked

with seasonal produce, and also includes gardening, nutrition education, on-site recycling and farm tours.

Stress at Home May Induce Diabetes In Children

According to a study published in *Diabetes Care*, children who face psychosocial stress from environmental factors may develop diabetes-related autoimmunity.

Psychosocial stress in the forms of high parenting stress, serious life events, foreign origin of the mother and low paternal education showed association to autoimmunity in a large population of children aged 1 year. These associations were not related to family history of diabetes, investigators noted.

Parents of 4,400 children indicated their levels of psychosocial stress at baseline (childbirth) and at 1 year. They also indicated their sociodemographic background. Each child was tested for type 1 diabetes, and autoantibodies associated with type 1 diabetes were analyzed.

"Psychological stress, measured as psychosocial strain in the family, seems to be involved in the induction, or progression, of diabetes-related autoimmunity in the child during the first year of life," investigators wrote.

Babies of Diabetic Mothers Have Major Health Problems

Babies born in the last decade to women with type 2 diabetes have an increased risk of serious health problems including stillbirth and birth defects, according to a study published in *Diabetes Care*.

Investigators from the Copenhagen University Hospital's Department of Obstetrics in Rigshospitalet, Denmark, found that babies born to women with type 2 diabetes fared worse than those born to women with type 1 diabetes or those born to women without diabetes. The problem appears to be increasing. Babies born between 1996 and 2001 to women with type 2 diabetes developed more serious health problems than those born to women with type 2 diabetes from 1982 to 1990. No incidents of major congenital malformations or perinatal mortality occurred in babies born in earlier years, however, 7% of patients in the later group had these complications. The number of young women with type 2 diabetes also increased.

Previous studies showed that uncontrolled blood

sugar levels at the onset of pregnancy may cause the fetus to develop serious health problems.

"It's possible that the earlier onset of diabetes may be associated with increasingly poor pregnancy outcomes, but to say so with certainty would require further study," said Tine Clausen, MD, lead researcher, in a news release. "Certainly, it's time to pay closer attention to the health care being delivered to women who develop type 2 diabetes before or during their childbearing years so that we can better protect their children."

Lifestyle Changes May Prevent Type 2 Diabetes

About 40% of adults aged 40 to 74 years have prediabetes, and studies show that adults aged >60 years are at increased risk for developing type 2 diabetes.

Weight loss and physical activity reduce the risk of developing this disease, according to the National Institutes of Health. It has launched "It's Not Too Late To Prevent Diabetes. Take Your First Step Today," along with the US Department of Health and Human Services (HHS) National Diabetes Education Program (NDEP). The launch is part of the NDEP's "Small Steps. Big Rewards. Prevent type 2 Diabetes."

The campaign's message – type 2 diabetes can be prevented or delayed – encourages adults aged >60 years to modestly change their lifestyle to prevent or delay type 2 diabetes.

"We are asking older adults to find out if they are at risk for type 2 diabetes, and we're showing them how to take action to prevent it," said James R. Gavin III, MD, chair of the NDEP, in a news release. "Older adults may not realize that they still have time to prevent diabetes, or that diabetes prevention is even possible. That's why the 'It's Not Too Late' campaign is so important."

Losing a small amount of weight, following a low-fat, low-calorie meal plan and getting 30 minutes of physical activity 5 days/week can delay or prevent the onset of type 2 diabetes.

Type 1 Diabetes, Eating Disorders Deadly Combination

Clinical eating disorders are not common in young women with type 1 diabetes, however, there is a high risk of mortality and morbidity in patients who have

both conditions.

High microvascular complication rates were seen in these patients. Investigators reporting in *Diabetes Care* noted a significant association between eating disorders, misuse of insulin and the complications.

A total of 87 young females ranging in age from 11 to 25 years were interviewed and assessed for eating habits and attitudes at baseline, and 63 were reinterviewed after 8 to 12 years. All patients were from pediatric or young adult diabetes clinics. Follow-up results were available for 13 patients who had an eating disorder and seven who reported either bingeing or purging.

Investigators wrote that 31 of the patients misused their insulin. They concluded that an increased prevalence of eating disorders is found among young females, and it bears a direct relationship to poor physical health, mortality and morbidity.

Insulin Resistance Treatment Promising for Stroke Prevention

Insulin resistance has been linked to pathophysiological derangements in type 2 diabetes that accelerate atherosclerosis. According to researchers from Yale University, treating insulin resistance with weight loss, exercise or medication can correct these derangements and may prevent stroke.

Type 2 diabetes affects 6% to 13% of adults in the United States, investigators reported in *Current Treatment Options in Neurology*. About 70% of stroke patients have known diabetes, occult diabetes or prediabetes. Type 2 diabetes is associated with a two- to six-fold increased risk for first or recurrent ischemic stroke. Associations between stroke and insulin resistance include effects of hyperglycemia on vascular tissues and coagulation and aberrations in blood pressure regulation, lipid metabolism, endothelial function, vascular inflammation, lipid metabolism, smooth muscle cell proliferation and fibrinolysis.

The most effective stroke prevention strategies among diabetic patients are blood pressure control, antiplatelet therapy and statin therapy. While tight glycemic control is recommended to prevent microvascular disease, first-line therapy for most patients is 500 mg/day metformin. Most patients will need two or three oral medications and many will eventually require insulin therapy, the investigators wrote. The best way to prevent diabetes is to identify those at risk and modify their diet, weight and exercise habits.

Adding Basal Insulin Once Daily Effective for Type 2

When initiating insulin treatment, glimepiride plus metformin supplemented by basal insulin glargine is safe and effective.

Compared to the use of two daily 70/30 injections, the therapy was safer and more effective for type 2 diabetic patients who failed to control their diabetes with oral antidiabetic agents (OAD), investigators wrote in *Diabetes Care*. They studied 371 patients, all of whom were insulin-naïve and had poor glycemic control, and randomized them to receive either treatment. Patients who received two OAD – glimepiride and metformin – also took a once-daily dose of insulin glargine in the morning. Those in the other group did not receive OAD, and were treated with 70/30 insulin (70% human NPH insulin and 30% regular) twice daily.

The study lasted 24 weeks, and investigators noted that patients using the OAD therapy were more likely to reach HbA1c $\leq 7\%$ versus those who did not receive the therapy. This decrease was also more pronounced among the type 2 diabetic patients taking OAD. The same group was also more likely to lower their fasting blood glucose levels and have fewer hypoglycemic episodes, investigators wrote.

Insulin Injections Twice Daily Not Ideal for Kids

Preschool aged type 1 diabetic children may not have their blood sugar adequately controlled with twice-daily injections of insulin, according to a study in *Diabetes Care*.

Investigators wrote that a continuous glucose monitoring system (CGMS) is well tolerated by these children, and allows them to keep track of their daily glucose trends better than self-monitoring blood glucose (SMBG) monitors. To reach these conclusions, investigators studied two blood glucose readings from 10 type 1 diabetic children aged <6 years who used CGMS (Medtronic MiniMed). They analyzed the frequency, duration and distribution of hypoglycemia and determined the accuracy of the CGMS in its detection.

Investigator George S. Jeha, MD, and colleagues from Texas Children's Hospital in Houston said that most children in the study spent a significant amount of time with hypoglycemia. They noted that as compared to the SMBG, CGMS systems were able to detect two times as many hypoglycemic events. ■