

Cognitive Function Not Impaired by Tight Glucose Control

Combined DCCT/EDIC data lay to rest fears regarding long-term effects of hypoglycemic events.

REVIEWED BY ALAN M. JACOBSON, MD

The Diabetes Control and Complications Trial (DCCT) followed 1,441 people with type 1 diabetes for a decade and showed conclusively that tight glucose control significantly reduces the risk of developing microvascular complications. The landmark trial revealed that the tight control achieved by taking three or more injections of insulin a day, however, often came with a price. Patients in the trial who kept their glucose levels as close to the normal range as possible were three times as likely to suffer episodes of severe hypoglycemia. This finding raised the fear that tight control may be linked to a long-term loss of cognitive ability, according to a news release from the Joslin Diabetes Center.

This fear turns out to be unfounded, according to data presented during the late-breaking session at the American Diabetes Association 66th Scientific Sessions in Washington, DC. Researchers from the Joslin Diabetes Center, in collaboration with investigators at the University of Pittsburgh Medical Center, George Washington University and the DCCT/The Epidemiology of Diabetes Interventions and Complications Study (EDIC) Research Group found that after following three-quarters of the original DCCT participants for an additional 6.5 years, there was no link between multiple severe hypoglycemic reactions and impaired cognitive function in people with type 1 diabetes in the study.

“This study provides further support for the safety of intensive diabetes therapy and the benefits of maintaining good glycemic control,” said principal investigator Alan M. Jacobson, MD, head of Joslin’s Behavioral and Mental Health Research Section and professor of psychiatry at Harvard Medical School. “While acute episodes of hypoglycemia can impair thinking and can even be life-threatening, patients with type 1 diabetes do not have to worry that such episodes will impair their long-term abilities to perceive, reason and remember.”

To evaluate if tight glucose control has long-term

adverse effects on cognitive function, the researchers examined 1,059 participants in the original DCCT trial: 537 patients received intensive therapy and 522 patients received conventional therapy. For the period of this study, 652 patients reported no hypoglycemic events resulting in coma or seizure; 348 reported from one to five events and 59 patients reported more than five.

All of the patients were evaluated using the same neuropsychological tests that researchers administered during the DCCT trial — tools that analyzed abilities in eight cognitive domains: problem solving, learning, immediate memory, delayed recall, spatial information, attention, psychomotor efficiency and motor speed. Adjusting for age, sex, years of education, length of follow-up, and the number of cognitive tests taken, the researchers found no change in any of the eight areas.

Higher HbA1c readings among patients were associated with a modest decline in motor speed and psychomotor efficiency, but no other cognitive domain was affected.

“This is very good news for patients with type 1 diabetes,” said Dr. Jacobson. “Severe hypoglycemia can still be a very dangerous condition. But with proper education, self-care and close medical follow-up, the risk of severe hypoglycemia can be lessened. Now we know that patients don’t have to worry about damaging their mental abilities as they work to significantly decrease their risks of developing diabetic retinopathy, neuropathy, nephropathy and cardiovascular disease.” ■

Alan M. Jacobson, MD, is head of Joslin’s Behavioral and Mental Health Research Section and professor of psychiatry at Harvard Medical School. He may be reached at 617-732-2657.

Jacobson AM, Ryan CM, Cleary PA, et al. Effects of intensive and conventional treatment on cognitive function 12 years after the completion of the Diabetes Control and Complications Trial. Presented at the American Diabetes Association 66th Scientific Sessions. June 9-13, 2006. Washington, DC.