Intensive Glycemic Control Protects Kidneys

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FROM KIDNEY WEEK 2011

PHILADELPHIA – Early, intensive treatment for type 1 diabetes with conventional therapy halves the long-term risk of developing an impaired glomerular filtration rate, the common pathway leading to end-stage kidney disease, Dr. Ian H. de Boer said at the meeting.

He reported new data from the Diabetes Control and Complications Trial (DCCT) and the follow-up Epidemiology of Diabetes Interventions and Complications (EDIC) study demonstrating a nearly 50% reduction in the risk of glomerular filtration rate (GRF) impairment – defined as an incident estimated GFR less than 60 mL/min per 1.73 m^2 of body surface area at two consecutive study visits – among individuals randomly assigned to intensive diabetes treatment versus those assigned to conventional treatment over a 22-year median follow-up.

In the multicenter DCCT, 1,441 individuals with type 1 diabetes were randomized to 6.5 years of conventional therapy (730 patients), consisting of one or two insulin injections daily designed to prevent hyperglycemic symptoms, or to intensive diabetes treatment (711 patients), consisting of three or more insulin injections daily or the use of an insulin pump in an attempt to achieve a glycated hemoglobin level of less than 6.05%, "as close to the nondiabetic range as possible," Dr. de Boer reported at the meeting sponsored by the American Society of Nephrology.

The study population included patients in a primary intervention cohort who had diabetes for 1-5 years with an albumin excretion rate of less than 40 mg per 24 hours and no retinopathy and those in a secondary intervention cohort with a 1- to 15-year history of diabetes, an albumin excretion rate of 200 mg or less per 24 hours, and no more than moderate nonproliferative retinopathy, he noted.

Of the DCCT participants, 1,375 agreed to participate in the observational extension EDIC study, including a statistically similar number of patients from the intensive and conventional therapy groups, Dr. de Boer reported. As per the protocol of both studies, serum creatinine levels were measured annually.

The mean hemoglobin A_{1c} level during the DCCT was 7.3% in the intensive treatment group and 9.1% in the conventional therapy group. "In the EDIC years 1-16, the mean hemoglobin A_{1c} was nearly 8% in each group, with no clinically or statistically significant difference," said Dr. de Boer of the University of Washington in Seattle.

During the combined 22 years of follow-up for both studies, "70 patients developed impaired [GFR], including 24 who had been assigned to intensive therapy and 46 who received conventional treatment," Dr. de Boer stated, noting that most of the cases occurred during the EDIC study period.

The time of the events is important, he said. "Only 4 of the 70 occurred during DCCT, and 66 occurred during EDIC study follow-up. Almost all of the events occurred more than 10 years after randomization."

The intensive therapy reduced the risk of impaired GFR by 50%, according to statistical analyses, Dr. de Boer said. Twenty years after randomization, "the cumulative incidence of an impaired GFR was 2.0% among those assigned to intensive therapy and 5.5% in those assigned to conventional therapy," representing an absolute risk reduction of 3.5%, he explained.

The study results were reported concurrently with the online publication of the data (N. Engl. J. Med. 2011;365:2366-76).

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