Hypertension and Renal Function Are Risk Factors for CAD in Type 1 Diabetes

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Life expectancy for individuals with childhood-onset type 1 diabetes (T1DM) has improved markedly in recent years and is now approximately only 4 years less than that of the general population [Miller RG et al. *Diabetes* 2012]. Although the level of glycemic control has improved and the frequency of renal disease has declined, the incidence of coronary artery disease (CAD) has not fallen proportionally and is among complications that show less favorable change over time [Pambianco G et al. *Diabetes* 2006].

Trevor J. Orchard, MBBCh, MMedSci, University of Pittsburgh, Pittsburgh, Pennsylvania, USA, presented findings from an examination of risk factors for CAD in 2 groups from the prospective Pittsburgh Epidemiology of Diabetes Complications [EDC] study of childhood onset (<17 years of age) of T1DM.

Individuals were diagnosed (or seen within 1 year of diagnosis) at Children's Hospital of Pittsburgh, Pennsylvania, USA, from 1950 to 1980. Baseline exams of 658 individuals took place from 1986 to 1988, and participants were followed biennially thereafter. Dr. Orchard's team studied 2 cohorts: those with consistently high HbA1C (n=157) and those with consistently low HbA1C (n=154).

The study's objective was to explore which risk factors may explain, in part, why those with consistently good long-term glycemic control remain at elevated risk for CAD. It also set out to determine whether risk factors for CAD in individuals with "better" long-term HbA1C differ from those of their peers and, thereby, may not be fully or appropriately addressed.

Incident CAD was defined as the first instance of CAD death, myocardial infarction, stenosis ≥50%, revascularization, ischemic electrocardiogram, or EDC physician-diagnosed angina. Medical records were obtained to confirm participant-reported CAD events. All deaths were investigated and cause(s) assigned by a physician committee. Hypertension was defined as blood pressure (BP) >140/90 mm Hg or receiving medication for BP.

HbA1C was measured at 7 clinical examinations (baseline and at 2, 4, 6, 8, 10, and 18 years of follow-up). The distribution of HbA1C was followed at each examination and divided into tertiles: consistently high, with HbA1C in the highest tertile at all exams; consistently low, with HbA1C in the lowest tertile at all exams; all others were excluded for purposes of the analysis.

Data showed a significantly higher (p=0.03) cumulative incidence of CAD in those with consistently high versus those with consistently low HbA1C.

Hypertension appears to be a major risk factor for CAD irrespective of glycemic control group; renal function seems to be particularly important in those who maintain better control of HbA1C; to further address CAD risk in those with better glucose control, the focus should be on renal function and hypertension.

Based on these data, Dr. Orchard speculated that HbA1C is not a major predictor in either group, although it appears to be stronger in those with estimated glomerular filtration rate >60 mL/min/1.73 m^2. While much of the HbA1C link with CAD is likely associated with and/or mediated by other factors, it may have a more specific role in those without markers of renal disease.

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