COMMENT ON LIN ET AL.

Risk Factors for Decline in IQ in Youth With Type 1 Diabetes Over the 12 Years From Diagnosis/Illness Onset. Diabetes Care 2015;38:236–242

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Lin et al. (1) reported changes in verbal intelligence quotient (VIQ), full-scale IQ (FSIQ), and performance IQ (PIQ) monitored in young patients with type 1 diabetes (T1D) over 12 years from disease onset, and risk factors such as early onset of diabetes and history of hypoglycemic seizures had a negative impact on VIQ and FSIQ. This is an interesting prospective study on the correlation between glycemic control and the development of the central nervous system in T1D. However, there are two concerns about this study.

First, the study results are concerning because two inconsistent findings were reported. First, no significant group differences were observed in PIQ between T1D patients and healthy control subjects (HCs). Second, young age at diabetes onset was significantly associated with negative change in PIQ. Linear regression analyses revealed that the predicted follow-up PIQ score reduces by 2.36 points per year for each early year of diabetes onset. If the second finding is valid, then T1D patients could have significantly lower PIQ scores than HCs. Although a mild association between cognitive deficits and an early age of disease onset was found in another study (2), this discrepancy in the two findings could partially be explained by age-related changes in IQ. IQ is known to increase with age from adolescence to adulthood; PIQ, FSIQ, and VIQ are known to peak at 20–24, 25–29, and 45–54 years, respectively (3). Because children who were 3 years old or older with newly diagnosed T1D were included at baseline, subjects with young age at diabetes onset would have reached adolescence and subjects with late onset would have reached young adulthood during the 12 years of follow-up. One way to determine the age-related determinant of IQ would be to perform linear regression analysis for the HC group, with changes in VIQ, PIQ, and FSIQ scores as dependent variables and age at baseline as the predictor variable. To reduce the influence of age on changes in IQ, age could be adjusted for PIQ, VIQ, and FSIQ in the regression analyses. The other solution would be to perform regression analyses on PIQ for T1D patients aged 20–24 years.

The second concern is that given the age-related changes that occur in IQ, it is inappropriate to state that positive change in VIQ, PIQ, and FSIQ scores indicates increase in IQ over time from baseline until the 12-year follow-up period and a negative change in scores indicates decline. Furthermore, decline in IQ scores was evident in both T1D patients and HCs. Thus, the negative change in IQ scores could exaggerate the actual effects of T1D on IQ. Indeed, several reasons could account for the decline in IQ. One explanation for this phenomenon could be the use of different test versions mentioned by the authors. Other factors could include the emotional and physical conditions of participants and different researchers who assessed participants' IQ at baseline and follow-up.

Duality of Interest. No potential conflicts of interest relevant to this article were reported.

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