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Editorials

Disentangling the influence of insulin dependent diabetes mellitus on refraction

The relation between the duration of insulin dependent, or juvenile onset, diabetes mellitus and changes in the refractive components of the eye undergoes a close and valuable assessment in the paper presented by Løgstrup *et al* in this month's issue of the *BJO* (p 343). While it is known that the duration of diabetes has a marked effect upon lens thickness^{1 2} and the development of diabetic retinopathy,³⁻⁷ ambiguity remains as to whether myopia is more or less prevalent in people with diabetes.⁸⁻¹⁰

To date, however, existing analysis of the influence of the duration of diabetes upon ocular features of particular interest has been difficult to obtain. This is primarily due to the difficulty in controlling for age-related changes, be they within the lens itself or elsewhere throughout the eye. The area chosen for investigation by the authors was to examine a subset of twins with insulin dependent diabetes mellitus (IDDM) from the Danish Twin Registry, thereby controlling for the effect of age related processes within the eye. Thus, from a cohort of 20 888 twin pairs born between 1953 and 1982, a total of 45 twin pairs with IDDM were available for detailed autorefractometry, autokeratometry, and ultrasonic biometry measurements. Twin pairs were roughly divided among monozygotic twin pairs (n=16), dizygotic twin pairs of the same sex (n=14), and dizygotic twin pairs of the opposite sex (n=15).

Interestingly, among monozygotic twin pairs there was a trend towards shortened axial length and a shift towards hyperopia with increasing duration of diabetes, although this did not reach statistical significance. By contrast, among dizygotic twin pairs of the same sex, refraction was negatively correlated with the duration of diabetes, while axial length was positively correlated with the duration of diabetes, and accompanied by a myopic shift, with both values reaching statistical significance. Among dizygotic twin pairs of the opposite sex no relation was found between the duration of diabetes and refraction, or axial length. Lastly, as with other studies, increasing lens thickness and decreasing anterior chamber depth with increasing duration of diabetes were observed.

Exactly why diverging results should be observed between monozygotic and dizygotic twins of the same sex

remains unclear. The authors propose that 'As a hypothesis, one might speculate whether the influence of diabetes during childhood would result in reduced growth of the eye in an axial direction with shorter eyes and refractive values in a more hyperopic direction as a consequence.' Added to this hypothesis, one must also consider the effect of diabetes upon altering the refractive power of the lens, although in both instances the small sample size of the present study provides no clear indication one way or the other as to which scenario is likely to predominate. Despite this, the feasibility of additional research in this area has been glimpsed. It would be interesting, for example, to perform similar studies on larger numbers of IDDM twin pairs to more fully disentangle the influence of the duration of diabetes on refraction across all zygosity groups.

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