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Diabetes cataract in a 10-year-old girl with new-onset type 1 diabetes mellitus

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DESCRIPTION

A 10-year-old white girl with newly diagnosed type 1 diabetes mellitus (T1DM) presented with progressive deterioration of vision in both eyes within 4 weeks of diagnosis. She had a 3-month history of polyuria, polydipsia, nocturia and generalised hair loss prior to diagnosis. Physical and neurological examination was unremarkable. Baseline ophthalmological examination did not show any diabetic retinopathies. Laboratory findings at presentation include: haemoglobin A1c (HbA1c) of 16.8% (normal 4.3%–5.6%), glucose of 763 mg/dL (normal 60–100 mg/dL), bicarbonate of 15 mEq/L (normal 22–32 mEq/L), anion gap of 24 (normal 3–13) and beta-hydroxybutyrate of 6.22 mmol/L (normal 0.02–0.27 mmol/L). She was started on a basal (glargine) and bolus (lispro) insulin regimen.

Follow-up 1 month after diagnosis showed that her glucose readings were at the target range of 90–150 mg/dL while receiving a mean daily insulin dose of 1 unit per kg. However, the patient's mother was concerned about her daughter's loss of independence due to a rapid decline in vision. Physical examination showed visual acuity limited to identification of colour and seeing moving shadows



Figure 2 Dilated eye examination of a 10-year-old girl showing dense white cataract of the right eye.

(‘hand motion’ vision) due to lens opacities in both eyes (figure 1). Red reflex with direct ophthalmoscope revealed blunted, whitened reflex bilaterally. The paediatric ophthalmologist confirmed the presence of bilateral dense, white cataracts without peripheral sparing and associated anterior chamber narrowing via dilated slit lamp examination (figure 2).

Cataract is a rare early ocular complication of T1DM in paediatric patients with an estimated prevalence of 0.7%–3.4%¹ and going up as high as 16% in patients of Haitian or African descent.² It is mostly seen in adolescent patients with the youngest patient reported at 5 years of age.¹ Activation of the polyol pathway and acute osmotic stress due to hyperglycaemia are implicated in the opacification of the lens in patients with diabetes. The specific pathophysiological mechanism of cataract formation early in the course of T1DM has yet to be established, however, it has been associated with longer prodromal periods and higher HbA1c (>12%) on diagnosis.³ The morphology of cataracts found in the younger patients with T1DM has been described as scattered opacities in the equatorial region of the lens (‘snowstorm cataract’) which progress rapidly over the course of weeks or months.⁴

Surgical extraction is the current gold standard in the management of early, visually impairing cataracts in patients with diabetes. There have been isolated reports of regression of metabolic cataracts with good glycaemic control, but there is stronger evidence to support early surgical management, especially among those with poorer visual acuity and when lens opacity obstructs the view of the fundus for examination.¹ Postoperative complications to watch out for include progression of



Figure 1 Bilateral eye opacities as seen on physical examination of an adolescent girl with newly diagnosed type 1 diabetes mellitus.



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diabetic retinopathy, macular oedema and posterior capsular opacification.⁴

Current guidelines recommend screening for chronic ocular complications starting 3–5 years after diagnosis of T1DM. However, these recommendations largely pertain to diabetic retinopathy and changes in the posterior vasculature of the eye over time. This case showing accelerated development of cataract within weeks from diagnosis is a good reminder to review eye examination in newly diagnosed patients with T1DM especially among those presenting with worsening vision despite improving glucose control.

Learning points

- ▶ Cataract development can occur early in disease course or at the time of diagnosis in patients with type 1 diabetes mellitus (T1DM).
- ▶ Cataract should be a differential diagnosis in patients with T1DM presenting with a blurring of vision despite improving glycaemic control.
- ▶ Diagnosis in adolescence, and longer prodromal periods prior and higher HbA1c (>12%) prior to diagnosis are risk factors suggesting earlier eye examination among newly diagnosed patients with T1DM.

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