CASE REPORT

Bilateral acute angle closure glaucoma associated with hydrochlorothiazide-induced hyponatraemia

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SUMMARY

We report a case of a 67-year-old woman presenting with bilateral acute angle closure. On investigation, she was found to have bilateral ciliary effusions and profound hyponatraemia. Her effusions resolved with the cessation of hydrochlorothiazide and normalisation of her blood sodium levels by fluid restriction. This case displays a novel association of hyponatraemia as a possible mechanism for the development of bilateral acute angle closure.

BACKGROUND

Bilateral acute angle closure has been associated with sulfonamide derivative medications including topiramate, acetazolamide, cotrimoxazole, sulfasalazine and hydrochlorothiazide.¹ The development of anterior uveal effusions and anterior rotation of the ciliary body can lead to forward

displacement of the iris-lens diaphragm and subsequent angle closure. We report a case of a patient developing bilateral ciliary effusions and angle closure potentially due to hyponatraemia induced by hydrochlorothiazide. To the best of our knowledge, hyponatraemia has not been implicated in the development of anterior uveal effusions and bilateral angle closure.

CASE PRESENTATION

A 67-year-old Inuit woman presented with a 4-day history of bilateral blurred vision, photophobia, headache and nausea. Her medical history was remarkable for type II diabetes and hypertension. Her medications included metformin, metoprolol, ramipril and hydrochlorothiazide, which was started 7 years earlier.

Symptoms of red eyes and blurred vision prompted an ophthalmic consultation. Ocular

Figure 1 Indentation gonioscopy with a Sussman lens: (A) Appositional angle closure (B) with minimal peripheral anterior synechiae, (C) elongated and anteriorly rotated ciliary processes.

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Figure 2 Ultrasound biomicroscopy reveals anterior uveal effusion: (A) longitudinal view at 9 o'clock OD, (B) transverse view at 9 o'clock OD. Resolution of effusions 1 week later: (C) longitudinal view at 9 o'clock OD, (D) transverse view at 9 o'clock OD.

examination revealed an uncorrected visual acuity of hand motions OD and counting fingers at 6 inches OS. Pupils were fixed and mid-dilated at 5 mm bilaterally with slight anterior convexity of the iris. Repeated tonopen measurement revealed intraocular pressures (IOPs) in the 60–70 mm Hg range OU. Slit lamp examination showed bilateral conjunctival hyperaemia, cloudy, oedematous corneas, 2+ pigment cells and central anterior chamber depths of <1.5 mm. Gonioscopy revealed 360° of appositional angle closure bilaterally (figure 1A) with minimal peripheral anterior synechiae (figure 1B) and visible ciliary processes (figure 1C). Optic nerves appeared healthy.

INVESTIGATIONS

On review of systems and routine blood examination, the patient was found to be profoundly hyponatraemic with a blood sodium level of 118 mmol/L (normal=136–145).

DIFFERENTIAL DIAGNOSIS

Acute angle closure is known to be associated with either anterior 'pulling' or posterior 'pushing' mechanisms. The bilaterality of this patient's symptoms suggested a systemic mechanism and ultrasound biomicroscopy (UBM) examination revealed small anterior uveal effusions in the eyes, 360° bilaterally (figure 2A, B).

TREATMENT

The patient was managed medically with topical azopt, combigan, prednisolone acetate, oral acetazolamide and intravenous mannitol. The next day IOP was 9 mm Hg OD and 12 mm Hg OS. At this point acetazolamide and mannitol were discontinued and homatropine was added.

Two days later, the IOPs were low at 6 mm Hg OD and 5 mm Hg OS, and thus topical antiglaucoma medications were stopped. However, the angle still had only slit-like openings 180° OD and 90° OS with persistent uveal effusions. Best corrected visual acuity (BCVA) was 20/70 OD and 20/80 OS. The patient was still hyponatraemic (Na=125 mmol/L) and treated with discontinuation of hydrochlorothiazide and fluid restriction

resulting in a normalisation of her sodium levels by day 4 (135 mmol/L).

OUTCOME AND FOLLOW-UP

On follow-up, the pressures remained well controlled. Choroidal effusions were noted by UBM to decrease over the next 2 weeks with a return of 20/20 vision (figure 2C, D).

DISCUSSION

This case is an example of bilateral acute angle closure associated with hydrochlorothiazide-induced hyponatraemia. While hydrochlorothiazide has been linked to bilateral angle closure in an idiosyncratic manner on initial usage² and also after prolonged usage,³ the association with hyponatraemia is novel.

Interestingly, some of the newer Anti-Epileptic Drugs (AEDs) such as oxcarbazepine and topiramate are associated with hyponatraemia.⁴ It is well known that topiramate can induce bilateral angle identical to that reported herein. A link between hyponatraemia and bilateral acute angle closure, however, has not previously been reported.

Learning points

- ▶ Hydrochlorothiazide can be associated with bilateral angle closure secondary to a 'posterior pushing' mechanism with the development of uveal and choroidal effusions.
- ▶ This case shows a patient with profound hyponatraemia and bilateral angle closure developing with hydrochlorothiazide, and resolving with cessation of the drug.
- ▶ The link between hydrochlorothiazide and bilateral angle closure may be a novel mechanism involving hyponatraemia.

Contributors SHC, RK, RLC and DHM were all involved in the clinical management of the patient. SHC, RK and DHM were integral to the composition and critical revising of the case.

Competing interests None.

Patient consent Obtained.

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REFERENCES

- 1 Lachkar Y, Bouassida W. Drug-induced acute angle closure glaucoma. *Curr Opin Ophthalmol* 2007;18:129–33.
- 2 Geanon JD, Perkins TW. Bilateral acute angle-closure glaucoma associated with drug sensitivity to hydrochlorothiazide. *Arch Ophthalmol* 1995;110:1231–2.
- 3 Lee GC, Tam CP, Danesh-Meyer HV, *et al.* Bilateral angle closure glaucoma induced by sulphonamide-derived medications. *Clin Exp Ophthalmol* 2007;35:55–8.
- 4 Guay DR. Oxcarbazepine, topiramate, zonisamide, and levetiracetam: potential use in neurotrophic pain. *Am J Geriatr Pharmacother* 2003;1:18–37.

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