CASE REPORT

Acute pulmonary oedema due to single dose acetazolamide taken after cataract surgery

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SUMMARY

An increase in intraocular pressure following cataract surgery is very common. The main reason for this condition is viscoelastic agent remaining in the eye, which leads to mechanical obstruction of the trabecular meshwork. Prophylaxis with oral acetazolamide is frequently practised to prevent this early rise in intraocular pressure in the preoperative and postoperative periods. We report a case of an 81-year-old man with acute pulmonary oedema due to prophylactic acetazolamide intake after cataract surgery. The case is presented in order to draw attention to this serious complication.

BACKGROUND

An increase in intraocular pressure (IOP) following cataract surgery is a very common problem.¹ The main reason for this condition is viscoelastic agent that has not been totally removed from the eye, which leads to mechanical obstruction of the trabecular meshwork. In the preoperative and postoperative periods, prophylaxis with oral acetazolamide is frequently practised to prevent this early rise in IOP.^{1 2} In this paper, a case of acute pulmonary oedema due to prophylactic acetazolamide given after cataract surgery is presented in order to remind the clinician of this serious complication.

CASE PRESENTATION

An 81-year-old man with chronic renal insufficiency underwent uncomplicated phacoemulsification and intraocular lens implantation surgery in

the right eye, under local anaesthesia. On the evening of the operation day (8 h after surgery), the patient experienced periocular discomfort. The IOP was 28 mm Hg on Goldmann applanation tonometry. He was given one tablet of acetazolamide 250 mg (Diazomid, Sanofi, Istanbul, Turkey) to reduce the IOP. Complete blood count and blood chemistry were within normal limits, and preoperative anteroposterior chest radiograph showed no pathology (figure 1A). Arterial blood pressure just before the operation measured 120/70 mm Hg. Neither parenteral nor enteral fluid was given to the patient preoperatively. The patient developed dyspnoea and cyanosis about 45 min after taking the acetazolamide. Blood pressure measured 190/130 mm Hg. Consequently, he received emergency oxygen support. On observing suspicious ST changes in his electrocardiogram, he was referred to cardiology. He had tachycardia and an S3 gallop rhythm, and diffuse crepitation was heard in both lungs. Echocardiographic examination showed left ventricular dysfunction and reduced ejection fraction. Anteroposterior chest radiograph was compatible with pulmonary oedema related to acute cardiac insufficiency (figure 1B).

TREATMENT

The patient was emergently transferred to the cardiology intensive care unit, with the diagnosis of hypertensive pulmonary oedema. He was treated with intravenous nitroglycerine, inhaled bronchodilators and ultrafiltration in haemodialysis. On

Figure 1 (A) Preoperative anteroposterior chest radiograph showing no pathology. (B) Postoperative anteroposterior chest radiograph demonstrating pulmonary oedema related to acute cardiac insufficiency findings.

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regression of his pulmonary oedema, the patient was discharged from the hospital, with further therapy planned.

DISCUSSION

Acetazolamide is a non-bacteriostatic sulphonamide and a carbonic anhydrase inhibitor.³ This drug is often used prophylactically to prevent IOP rise after cataract surgery.^{1 3} The drug decreases the IOP by inhibiting the production of aqueous humour from the ciliary body.³

Acetazolamide frequently causes side effects related to hypersensitivity to sulphonamide derivatives (bone marrow depression, skin toxicity, anaphylactic shock), and almost all side effects of the drug have been explained with this hypersensitivity mechanism.^{4–7} On the other hand, pulmonary oedema related to acetazolamide is a rare side-effect, the mechanism of which has not fully been clarified.^{5 7} However, immune-mediated mechanisms have been thought to be responsible for this side-effect.⁷ Any preoperative or postoperative intervention can be the reason of pulmonary oedema. However, this patient developed pulmonary oedema 10 h after surgery and 45 min after taking acetazolamide. Given the fact that acetazolamide peaks at 2 h, and its effects last for 6–12 h, this clinical scene is most likely related to this medication.⁸ Moreover, in the patient's anamnesis, there was history of neither sulphonamide allergy nor former use of acetazolamide.

Zimmermann *et al*⁵ reported a case of a 76-year-old man with recurrent shock and transient non-cardiogenic pulmonary oedema within a period of 2 months—occurring each time after cataract surgery and 30 min after intake of a single oral dose of standard postoperative medication containing acetazolamide. Vogiatzis *et al*⁶ described a case of an 80-year-old woman who experienced serious anaphylactic shock and acute pulmonary oedema caused by half a 250 mg tablet of acetazolamide given in order to control preoperative IOP before cataract surgery. Peralta *et al*⁷ reported a case of a 66-year-old woman who developed anaphylactic shock and died after taking 250 mg of acetazolamide. The authors suggested that this adverse effect was attributable to cross-reaction with sulphonamide.

The patient was stable prior to surgery and neither preoperative, peroperative nor postoperative parenteral or enteral fluids were given. Dyspnoea and cyanosis started about 45 min after taking acetazolamide and blood pressure was measured 190/130 mm Hg at this time. Although this can be a coincidence, the possibility of acetazolamide inducing this acute cardiac insufficiency cannot be excluded.

Contraindications for acetazolamide use include a history of hypersensitivity to acetazolamide or its excipients, reduced levels of serum sodium and/or potassium (renal and hepatic dysfunction or disorders, adrenal insufficiency, hyperchloraemic acidosis) and cirrhosis. Although our patient had chronic renal

insufficiency, his normal electrolyte levels did not indicate contraindication for acetazolamide.

Learning points

- ▶ Acetazolamide is a sulfonamide derivative and a carbonic anhydrase inhibitor that is often used in ophthalmology for therapy and prophylaxis of intraocular pressure rise. In this paper, a case of acute pulmonary oedema related to prophylactic single-dose acetazolamide taken after cataract surgery is presented in order to spread awareness about this serious complication and to bring to mind the contraindications for acetazolamide use.
- ▶ Anaphylactic shock and pulmonary edema are unusual but life-threatening adverse reactions of this drug. Immunemediated mechanisms have been thought to be responsible for this side-effect. Therefore we suggest the careful monitoring of patients with prior history of allergic reactions to sulphonamides during oral administration of the first dose of acetazolamide.

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Contributors SGY was responsible for organising and reporting data. MP was responsible for the idea and research planning. CG was responsible for supervision and overall responsibility.

Competing interests None declared.

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