

Extravasation of acetazolamide

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Dear Editor,

Acetazolamide is a safe diuretic drug that has frequently been used for many years, especially by ophthalmologists, for the reduction of an acute rise in intraocular pressure in glaucoma. The reported side effects of intravenous administration have been extremely low. I would like to draw to the attention of the ophthalmologists in Hong Kong a case of acetazolamide extravasation causing severe soft tissue injury.

The patient is a 54-year-old lady with uveitic glaucoma who has been attending a Hospital Authority referral center since 1998. She was diagnosed with glaucoma by a private ophthalmologist and was treated accordingly. The patient also had hypertension, thyrotoxicosis (treated by radioiodine) and sclerodactyly.

The patient's condition had been relapsing with recurrent attacks of uveitis (antinuclear factor [ANF] titer 1280) and glaucoma (as a result of uveitis), which was controlled by antiglaucoma drugs. The patient had an episode of uveitis and a rise in IOP at the end of July this year and, because of the high intraocular pressure, she was given an intravenous injection of acetazolamide 500 mg. The patient had previously taken oral acetazolamide with no side effects apart from a tingling sensation in her fingers.

The acetazolamide was given by an ophthalmologist using the standard procedure of reconstitution with 5 ml of sterile water via a disposable syringe with a 21 gauge needle and prior swabbing with a disposable sterile Alcohol Prep Pad. The injection was given over 2 to 3 minutes into the left antecubital fossa. After a free and smooth flush back of blood was observed in the syringe the drug was injected without much resistance. However, after injecting about 4 ml of the drug, a slight local swelling was observed around the injection site and the injection was discontinued.

Drug extravasation was suspected and local pressure was applied with a sterile cotton wool swab to stop the bleeding and reduce the swelling. The patient then felt pain and slight numbness of her forearm down to her fingers. She was given supportive treatment including lying down with her limb elevated and her condition was closely monitored.

After about an hour, the patient recovered with no more numbness and her condition was then reassessed. Her radial pulse was normal and the swelling over the injection site had subsided. The patient was discharged and no special complaints were mentioned to the attending ophthalmologists during her follow-up visits until 10 days after the injection when she complained of pain over her elbow (after performing rowing exercise at home). Examination revealed that she had superficial cellulitis with erythematous swelling over her left elbow without any gross signs of suppuration. The patient had applied some Mentholatum Deep Heat rub to the elbow after the onset of the cellulitis.

The patient was subsequently admitted and systemic antibiotic therapy was prescribed, with no effect. Chills and fever were also noted after her admission. Eventually, the orthopedic department was consulted and incision and drainage with exploration was done 15 days after the injection. During the operation, extensive superficial soft tissue necrosis was observed and debridement was performed (**Figure 1**). Culture results from the wound were negative. The wound measured approximately 3 inches by 1 inch and was left open for local dressing, and subsequently closed by secondary intention and undermining of surrounding tissues (**Figure 2**). The wound closure was uneventful and the patient regained a full range of elbow movement after rehabilitation and physiotherapy.



Figure 1. Intraoperative photo of the wound before incision and drainage.



Figure 2. The wound before closure by secondary intention.

Acetazolamide (diamox) is an alkaline drug with a pH value of 9.2 and is not recommended for direct intramuscular injection. Published papers on severe tissue reaction due to extravasation are extremely rare (despite its frequent usage by ophthalmologists) and only one 'Letter to the Editor' has

reported a similar experience.¹ However, the reaction was more rapid (approximately 90 minutes after the injection) and the wound also required two plastic surgical repairs. On the other hand, compared with other drugs such as cytotoxic substances, tissue damaging effects of acetazolamide have not been so devastating. Different management options for drug extravasation have been discussed in various papers,¹⁻⁷ whereas only one paper proposed some measures for the management of extravasation of acetazolamide, although this was only anecdotal since the incidence of severe damage by the drug is so rare. There has been no evidence of the effectiveness of treating acetazolamide extravasation by 3.8% sodium citrate, cold compresses, massage, topical steroids, or hyaluronidase.

On the other hand, extravasation of fluorescein causing serious tissue injury (cellulitis and skin necrosis) has been more frequent (with 12 reported cases)⁸ and is suspected to be the result of idiosyncratic reactions. Thus, the possibility of severe tissue reaction has to be kept in mind when intravenous injection of acetazolamide is administered or when injecting fluorescein dye during fundus fluorescein angiography. Proper medical attention and close follow-up of areas other than the ocular condition is recommended in cases of extravasation of these common ophthalmic drugs.

References

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