Novel treatment (new drug/intervention; established drug/procedure in new situation)

Use of phentolamine in the treatment of Epipen induced digital ischaemia

Jingyuan Xu, Alice Holt

Accident and Emergency Department, New Cross Hospital, Wolverhampton, UK

Correspondence to Dr Jingyuan Xu, j.xu@nhs.net

Summary

A 33-year-old lady accidentally injected norepinephrine into her right thumb while cleaning the first aid box where a spare Epipen for her son was kept. She presented with pain, pallor and swelling to the distal phalanx of the right thumb. After a prompt literature search and discussing the case with the National Poisons Information Service, local injection of 0.15 ml (1.5 mg) of phentolamine in 1 ml of 2% lignocaine was advised. Peripheral perfusion was restored immediately after injection and fully recovery was noted at the review clinic the following day. The presentation of this case in the accident and emergency department prompted phone calls and literature search to define the most appropriate evidence-based management for this situation. The authors conclude that local infiltration of phentolamine is the treatment of choice and this highlighted the need for local treatment protocols.

BACKGROUND

Increased awareness and early recognition of anaphylactic reactions have amplified prescriptions for norepinephrine auto-injector devices (Epipen, Epipen Junior) in the last decade. Five per cent of the paediatric population have some form of food allergy. In one study assessing the extent of nut allergy in school, 26% of the allergic patients carry an Epipen.¹ With this increase, there has been greater incidence of accidental auto-injection into digits resulting in severe pain and in some cases necrosis due to the severe ischaemia.² This could result in significant discomfort and morbidity. As a relatively infrequent presentation in the emergency department it is important to highlight the appropriate management in such patients.

CASE PRESENTATION

A 33-year-old lady presented in the accident and emergency department after accidentally injecting norepinephrine 0.3 mg of 1:1000 from an Epipen while cleaning the family first aid box. The patient had severe pain in her right thumb, on examination the distal phalanx of the thumb was pale, cold and swollen with prolonged capillary refill time. No systemic features were present.

TREATMENT

Local injection of 0.15 ml (1.5 mg) of phentolamine in 1 ml of 2% lignocaine.

OUTCOME AND FOLLOW-UP

Circulation returned to finger immediately after injection with a significant reduction in pain. Subsequent follow-up was arranged for review clinic the following day where she was discharged without sequelae.

DISCUSSION

The incidences of accidental injection in the UK have been shown to 1 per 50 000 Epipen units.³ No case of digital loss due to accidental injection has been reported, however the resulting severe pain and subsequent necrosis cannot be overlooked.^{2 4} One study interestingly showed that up to 16% of tested doctors who read the instructions on the Epipen device self-injected the Epipen trainer into their thumb.² This demonstrates the need for better education regarding Epipen administration as well as an unambiguous treatment protocol should this happen.

Various treatment options have been tried to reverse the local effect of norepinephrine in the digit. Case reports have shown that if left untreated, peripheral circulation returned after 8 h, which would have caused adverse outcomes and severe distress to the patient.⁵ Application of topical nitroglycerin and warm water immersion have been attempted to restore perfusion, but showed no significant improvement in comparison to no treatment.⁶ One case of the use subcutaneous infiltration of terbutaline has been reported.⁷

The effectiveness of phentolamine, an α -blocker normally used for control of blood pressure during surgical resection of catecholamine producing tumours, in the management of accidental digital norepinephrine injection was first shown by Jordan in 1969 whereby a dental assistant had administered norepinephrine to a cut finger to reduce bleeding.⁸ Hinterberger suggested direct local infiltration is the most effective as this allows phentolamine to access the affected receptors and any residual norepinephrine directly.⁹ Local infiltration into the puncture site has been successful in restoring perfusion within 1 h in most cases and it has been recognised that the treatment is effective up to 13 h after the accidental digital injection.¹⁰

Unfortunately, phentolamine is not routinely available in accident and emergency departments and treatment advice remains poorly publicised. Both should be readily accessible, as cases have demonstrated that the use of phentolamine is particularly beneficial in relieving symptoms of vasoconstriction.

This report highlights the importance of quick access to reliable information in the case of unusual presentation and the need to define a protocol, for the management of EpiPen induced digital ischaemia. The information should be readily available in accident and emergency department and also distributed locally among health professionals such as general practitioners who may encounter similar cases.

Learning points

- ▶ EpiPen induced digital ischaemia can cause severe morbidity if left untreated.
- ▶ Phentolamine should be more readily available in the treatment of accidental digital injection of norepinephrine.
- ▶ Local protocols are needed for the treatment of EpiPen induced digital ischaemia.
- ▶ The role of the internet as an adjunct in managing unfamiliar situations and practising evidence based medicine.

Competing interests None.

Patient consent Obtained.

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Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Xu J, Holt A. Use of phentolamine in the treatment of EpiPen induced digital ischaemia. *BMJ Case Reports* 2012; 10.1136/bcr.12.2011.5450, Published XXX

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