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75 Treatment of the first known case of king cobra envenomation in the United Kingdom, complicated by severe anaphylaxis

[Link to abstract]

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Thank you for the opportunity to respond to Dr Winkel's interesting and useful comments. The clue to the management of this case is in the title. Life threatening envenomation is incredibly rare in the UK, and in the first instance advice will be sought from regional poison centres. Most doctors in acute care in the UK will never come across a case.

One of us (JAC) worked in an elapid endemic area 25 years previously, and instituted the first aid measures of a firm lymphatic bandage and immobilisation. However, signs of systemic envenomation were already present at this stage. Hypertension following intubation persisted despite adequate sedation which tends to refute the suggestion that it was caused by awareness. The use of labetalol to control the hypertension, whilst debatable in retrospect, was chosen as it has a short duration of action and is , therefore, easy to control. At that stage it was not evident that adrenaline would be required later, and as it has relatively weak alpha blocking activity it would be unlikely, in clinical practice, to interfere with adrenaline in the dose used.

As Dr Winkel says, King Cobra venom is a mixture of toxins and enzymes, and we were expecting other clinical manifestations of envenomation to develop. However, there was no haematological, cardiac or enzyme disorder abnormality detected.

Dr Winkel also states that the decision to pre-treat with adrenaline is not universally recommended; the advice from our expert at the Liverpool School of Tropical Medicine was to not give it as pre-treatment. We would repeat our recommendation that in such rare cases urgent advice from an expert should be sought, and having taken that advice it should be followed.

Finally whilst we agree that snake-handlers should practice safe-handling techniques and have an emergency first aid plan, to suggest that they should also maintain their own antivenom stocks is probably impractical given the rarity of this event in the UK and other non-elapid endemic countries, particularly given the rapidity with which antivenom can be obtained from major poison centres. Our patient, despite failing to undertake basic first-aid, was extremely fortunate in that on running out of the reptile outlet a police car happened to be the first car cruising past, and he was

taken immediately to hospital.

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20 February 2007
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We would like to raise several points concerning snakebite management as reported by Veto et al [1]. Firstly, effective first aid was not given. The pressure-immobilisation technique is the recommended first aid for neurotoxic elapid bites [2, 3]. It involves limb immobilisation with splints (omitted in this case) preceded by pressure bandaging of the entire limb [4, 5]. In a previous case of a king cobra bite in the USA, the patient drove himself to hospital and thus facilitated movement of venom and potentially hastened the onset of neurotoxicity [6]. This case also illustrates the lack of reliable prediction of adverse anti-venom reactions by the use of test dosing, a practice contra-indicated by formal studies [7, 8].

Secondly, no premedication was given to prevent or ameliorate an adverse reaction to anti-venom. Prevention of adverse reactions to anti-venom has been the subject of several studies. A randomised controlled trial of subcutaneous adrenaline [9] showed that it reduced the reaction rate and diminished the severity of adverse reactions. On the other hand, neither promethazine nor hydrocortisone alone is effective [10, 11] while a combination of hydrocortisone and chlorpheniramine is better than placebo [11]. Adrenaline prophylaxis has been adopted in some clinical environments [12] but is discouraged in others [13]. If given, it should be given subcutaneously, not intravenously or intramuscularly since it may otherwise provoke a serious haemorrhage in the presence of venom-induced coagulopathy [14].

Since the patient became hypertensive after intubation and before the administration of anti-venom, we question the degree of sedation given to this patient. This possible awareness-induced hypertension complicated the subsequent management of anaphylaxis that was treated, in part, by labetalol before adrenaline was required for anti-venom-induced bronchospasm and hypotension. Labetalol is contra-indicated in an asthmatic patient, since, like propanolol, it may precipitate bronchospasm and hypotension [15], and as a beta-adrenergic antagonist, it competes with adrenaline for binding sites on post-synaptic norepinephrine receptors [16], and may reduce the efficacy of adrenaline in treating anaphylaxis.

This case report also illustrates the rapidity with which neurotoxicity may develop, and if, as in this case, anti-venom is not immediately available, anticholinesterases should be considered, since these can rapidly improve neuromuscular function after Asian cobra bites [17].

The venom of Ophiophagus hannah is a complex mixture rich in potent postsynaptic neurotoxins, cytolytic cardiotoxins, myotoxins, platelet aggregation agonists, fibrinolytic peptides and other components. Given this complexity it would be of interest to know whether any haemostatic, enzymatic or cardiotoxic abnormalities were evident in this patient. It would also be of interest to know the outcome of the isolated finger ischaemia.

Finally, this case should encourage snake handlers, particularly those employed by specialist reptile outlets and zoos, to:
- adopt safe handling practices to reduce the risk of snakebite;
- develop emergency action plans that includes appropriate first-aid techniques;
- and maintain appropriate anti-venom stocks so that delays to life-threatening treatment may be avoided.

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