

Antivenom Reactions - Introduction

Polyvalent antivenoms of Indian manufacture are used in Sri Lanka, produced using the venoms of Indian snakes—cobra, Russel's viper, common krait and saw-scaled viper. Reactions following antivenom administration - either early (within a few hours) or late (5 days or more) - are common. As many as 81% of recipients of antivenom incur a reaction, and as many as 43% were severe reactions^{1, 2}. As treatment of reactions is an essential part of the management of a snakebite victim this article has been compiled as an introduction to the subject with material taken from the WHO Guidelines, pages 131 & 134, sections 6.7.5 & 6.7.5.4³.

1. Early anaphylactic reactions: usually within minutes and up to 180 minutes after starting antivenom, the patient begins to itch (often over the scalp) and develops urticaria, dry cough, fever, nausea, vomiting, abdominal colic, diarrhoea and tachycardia. A minority of these patients may develop severe life-threatening anaphylaxis: hypotension, bronchospasm and angio-oedema.

2. Pyrogenic (endotoxin) reactions: usually develop 1-2 hours after treatment. Symptoms include shaking chills (rigors), fever, vasodilatation and a fall in blood pressure. Febrile convulsions may be precipitated in children. These reactions are caused by pyrogen contamination during the manufacturing process. They are commonly reported.

3. Late (serum sickness type) reactions: develop 1-12 (mean 7) days after treatment. Clinical features include fever, nausea, vomiting, diarrhoea, itching, recurrent urticaria, arthralgia, myalgia, lymphadenopathy, periarticular swellings, mononeuritis multiplex, proteinuria with immune complex nephritis and rarely encephalopathy. Patients who suffer early reactions that are treated with antihistamines and corticosteroids are less likely to develop late reactions.

TREATMENT OF REACTIONS

Treatment of antivenom reactions: Early anaphylactic antivenom reactions: Epinephrine (adrenaline) is given intramuscularly (ideally into the upper lateral thigh) in an initial dose of 0.5 mg for adults, 0.01 mg/kg body weight for children. Patients who remain shocked and hypotensive should be laid supine with their legs elevated and given intravenous volume replacement with 0.9% saline (1-2 litres rapidly in an adult). Intravenous epinephrine (adrenaline) infusion should be considered [adult dose 1mg (1.0 ml) of 0.1% solution in 250 ml 5% dextrose or 0.9% saline - i.e. 4 µ (micro) g/ml concentration) - infused at 1–4 µ (micro) g/minute (15–60 drops/min using a microdropper burette chamber), increasing to maximum 10 µ (micro) g/min] and, in patients who remain hypotensive, a vasopressor agent such as dopamine [dose 400mg in 500ml 5% dextrose or 0.9% saline infused at 2–5 µ (micro) g/kg/min].

¹ Ariaratnam CA, Sjöström L, Raziak Z, Kularatne SA, Arachchi RW, Sheriff MH, Theakston RD, Warrell DA (2001). An open, randomized comparative trial of two antivenoms for the treatment of envenoming by Sri Lankan Russell's viper (*Daboia russelii russelii*). *Trans R Soc Trop Med Hyg.* 2001 Jan-Feb;95(1):74-80.

² de Silva HA, Ryan NM, de Silva HJ (2016). Prevention and treatment of adverse reactions to snake antivenom. *British Journal of Clinical Pharmacology* 2016; 81: 446-452.

³ Guidelines for the management of snake-bites, 2nd edition, World Health Organization 2016.

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Patients who remain dyspnoeic, with bronchospasm or angioedema, should be propped up at 45 degrees and given supplemental oxygen by any available route together with optimal nebulised/inhaled and/or parenteral bronchodilator (β_2 agonist)⁴.

Pyrogenic reactions: the patient must be cooled physically (remove clothing, tepid sponging with fanning) and given an antipyretic (e.g. paracetamol by mouth or suppository). Intravenous fluids should be given to correct hypovolaemia. Patients who also exhibit features of anaphylaxis should be given adrenaline as well (see above).

Treatment of late (serum sickness) reactions: Late (serum sickness) reactions may respond to a 5-day course of oral antihistamine. Patients who fail to respond within 24-48 hours should be given a 5-day course of prednisolone.

Doses: Chlorphenamine: adults 2 mg six hourly, children 0.25 mg/kg /day in divided doses.

Prednisolone: adults 5 mg six hourly, children 0.7 mg/kg/day in divided doses for 5-7 Days

Compiled by Malik Fernando
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⁴ Kemp AM, Kemp SF (2014). Pharmacotherapy in refractory anaphylaxis: when intramuscular epinephrine fails. *Curr Opin Allergy Clin Immunol.* 14(4):371-8.