Sublingual glyceryl trinitrate as prehospital treatment for hypertension in Irukandji syndrome

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TO THE EDITOR: The Irukandji syndrome can cause severe hypertension (over 220/110 mmHg)[1] and has caused two fatalities from cerebrovascular haemorrhage.[2] There is no first aid treatment for the severe pain or hypertension, so developing an effective prehospital treatment is a priority.

The venom from the jellyfish that causes Irukandji syndrome (*Carukia barnesi)* is a sodium-channel agonist which causes massive release of noradrenaline.[3] Intravenous magnesium sulfate has proven to be an effective treatment for the symptoms of Irukandji syndrome,[4] but requires in-hospital monitoring. We investigated the use of sublingual glyceryl trinitrate spray (GTN), which is a vasodilator, in three sting victims, in whom it appeared to effectively control hypertension.

Three patients with clinically confirmed Irukandji syndrome were given one puff of GTN sublingually for hypertension. Blood pressure (BP) was checked every minute for 5 minutes (by electronic sphygmomanometer). Further puffs of GTN were given every 5 minutes, with the aim of reducing the diastolic pressure below 100 mmHg. The treatment and clinical course of each patient is described.

- Patient 1 was a 43-year-old man with severe Irukandji syndrome (adrenergic symptoms, severe low-back and muscular pains) who presented 40 minutes after *Carukia barnesi* envenomation on an island in the Whitsundays. Despite being given 10 mg morphine intravenously, his BP was 200/112 mmHg. One puff of GTN was given, and after 5 minutes his BP was 180/120 mmHg; another puff reduced it to 170/110 mmHg, and 10 minutes after a third puff it was 160/100 mmHg. After transfer to a mainland hospital, his clinical course was stormy. His hypertension was poorly controlled by intravenous magnesium and he required intravenous nitrates and morphine.
- Patient 2 was a 49-year-old man with pain (for which 10 mg morphine and 50 mg promethazine were given intramuscularly), adrenergic symptoms and a BP of 182/110 mmHg 25 minutes after *Carukia barnesi* envenomation on a Whitsunday Island. One puff of GTN reduced his BP to 170/96 mmHg within 5 minutes; a second puff reduced it to 140/90 mmHg at a further 5 minutes. His BP remained at this level until he was transferred to hospital an hour later.
- Patient 3 was a 33-year-old woman with pain (treated with 10 mg morphine and 50 mg promethazine given intramuscularly), adrenergic symptoms and mild hypertension (143/98 mmHg) 35 minutes after *Carukia barnesi* envenomation on the same Whitsunday Island. She was given three puffs of GTN, which reduced her BP to 130/80 mmHg after 30 minutes.

None of the three patients had pre-existing hypertension, or took medication.

GTN reduces hypertension by vasodilation, and is now recommended for hypertension from dysreflexia in patients with spinal injury,[5] in whom similar high levels of serum catecholamines occur. Further assessment of GTN use in patients with Irukandji syndrome is necessary, but we believe it should be considered as prehospital treatment under medical guidance. It is currently the recommended treatment by Ambulance Officers in the Queensland Ambulance Service.[6]

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1. Fenner PJ, Williamson J, Callanan VI, Audley I. Further understanding of, and a new treatment for, "Irukandji" (*Carukia barnesi*) stings. *Med J Aust* 1986; 145: 569, 572-574.
2. Fenner PJ, Hadok JC. Fatal envenomation by jellyfish causing Irukandji syndrome. *Med J Aust* 2002; 177: 362-363.
3. Tibballs J, Hawdon G, Winkel K. Mechanism of cardiac failure in Irukandji syndrome and first aid treatment for stings [letter]. *Anaesth Intensive Care* 2001; 29: 552.
4. Corkeron MA. Magnesium infusion to treat Irukandji syndrome [letter]. *Med J Aust* 2003; 178: 41.
5. Queensland Health. The Queensland Spinal Cord Injuries Service. Autonomic dysreflexia. Available at: www.health.qld.gov.au/qscis/INFOdysreflexia.htm (accessed Sep 2003).
6. Queensland Ambulance Service. Marine envenomation education program. Facilitator guided overview. Brisbane: QAS, 2003: 2. ❑