

Box Jellyfish (*Chironex fleckeri*) Antivenom and 'Irukandji' (*Carukia barnesi*) stings.

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Quite apart from media and public reporting, on the basis of the documented records that are now available means of the newly established report rig network for marine envenomations organised by two of us (P.F. and J.W.) and that of the Surf Life Saving Association of Australia, the 1985-1986 summer season in northern Australia has produced the greatest number of "Irukandji" (*Carukia barnesi*) stings in human bathers and divers for many years.

The "Irukandji syndrome" has been fully described by its discoverer, the late Dr Jack Barnes, elsewhere.' The extreme unpleasantness of this envenomation is eloquently indicated in Barnes' remark, "I would prefer a small *Chironex fleckeri* sting to that of an 'Irukandji', any day!"

The Journal has previously reported evidence for the effectiveness of the Commonwealth Serum Laboratories' (CSL) specific *Chironex fleckeri* (box jellyfish) antivenom in the treatment of confirmed serious *Chironex fleckeri* stings.' From time to time colleagues have asked whether this specific antivenom could be used with benefit in the management of the severe pain of other Australian jellyfish stings. Apart from the usual general objections to such an approach,' there has been little objective data on which to base an answer to this question.

We wish to report here two cases of confirmed "Irukandji syndrome", in which box jellyfish antivenom was used, with little specific benefit.

At 2.00 p.m. on March 2, 1986, while bathing in deep, rough water on the edge of breaking surf at Mackay Harbour Beach, north Queensland, a previously fit 48-year-old man was stung on the right upper arm by an unidentified jellyfish. (The weather at the time was hot, with a 20-knot wind blowing on-shore.) The sting was described as painful, but as he had previously seen some "hair jellies" (*Cyanea capillata*) in the water he thought nothing of it and continued to swim for another 15 minutes before leaving the water.

Thirty minutes after the original envenomation the patient felt pain in his back; this became so severe that he had to seek medical attention. When seen shortly after this the patient was obviously distressed and was complaining of severe pains in the back and both legs. There were no visible sting marks but there was a small patch of erythema on the victim's upper, inner right arm. The sting was diagnosed as that of an "Irukandji" (*Carukia barnesi*),' and the patient was admitted to hospital where he was given pethidine (100 mg) and metoclopramide (10 mg) by deep intramuscular injection. At this stage his pulse rate was 64 bpm, his blood pressure, 145/100 mm Hg and his respiratory rate was 24/min.

The drugs gave little relief and within two hours the patient was again rolling around the bed in pain. The intravenous administration of diazepam led to moderate pain relief and the patient settled for another 30 minutes before the severe pains started again. The pains were described by the patient as severe back and leg pains that came in waves, building up slowly over several minutes to a maximal peak where they remained for up to 15 minutes before fading, only to return again about five minutes later.

At this stage, three-and-a-half hours after the original envenomation, it was decided to try box jellyfish antivenom, as the "Irukandji" is of the class Cubozoa, and as such is a type of "box jellyfish". Twenty thousand units in 2.02 ml (that is, one ampoule) of antivenom was mixed with 10 ml normal saline and administered by the intravenous route. Before the injection the pulse was 76 bpm, the blood pressure, 180/100 mm Hg and the respiratory rate was 24/min. These remained unchanged after the injection but within a couple of minutes the pains had disappeared completely and the patient remained pain-free for half-an-hour before the waves of pain returned just as severely as before.

Another 20 000 units of box jellyfish antivenom were administered by the intravenous route, again diluted in 10 ml of saline, and a similar effect was observed; the pain relief again lasted 30 min before returning as severely as before. The patient then received another 100 mg of pethidine by the intramuscular route. This helped to settle the pain until it finally faded away, at approximately 7.30 p.m., some five-and-a-half hours after the envenomation.

At 12.30 p.m. on February 21, 1986, at Shute Harbour in north Queensland, while installing a boat propeller in eight feet of water, a 34-year-old man was stung on the left neck and shoulder by an unidentified jellyfish. (The weather at that time was hot and cloudy, with a light south-easterly breeze.) Apart from erythema in the sting area, no visible sting marks appeared. The immediate pain at the sting site was soon followed by increasing backache, abdominal pain, chest "tightness" and leg pains. Loss of consciousness did not occur; his pain appeared to come in waves and he vomited three times.

A local doctor, who was summoned because of the patient's increasing distress, administered pethidine (200 mg), diazepam (10 mg) and three ampoules (60 000 units) of specific box jellyfish antivenom by the intravenous route, "with apparent improvement". The patient was then transferred immediately to the nearest hospital where one of us (DR) took over his management. When first seen, the patient was thrashing about in severe pain, but had no apparent skin wheals. His pulse rate was 92 bpm, blood pressure, 200/120 mm Hg and the respiratory rate was 24/min; he had generalised abdominal rigidity. No clear clinical history was available, so promethazine (25 mg) was administered intravenously, and a subcutaneous injection of adrenaline 1/1000 (0.25 mg), and one further intravenous dose (20 000 units) of specific box jellyfish antivenom were given.

The patient then developed unifocal ventricular ectopic beats which persisted for about 15 minutes, but settled spontaneously. His severe pain persisted, and was not improved appreciably by a further intravenous injection of pethidine (70 mg).

Intravenously-administered morphine (8 mg), followed by a continuous intravenous infusion of morphine at last began to provide some pain relief, two-and-a-half hours after the envenomation. The next day the patient had short runs of idioventricular rhythm, and he subsequently developed a chest infection that was ascribed to aspiration. This probably had occurred during his period of impaired conscious state, on the night of the morphine infusion. This complication settled with antibiotic therapy.

Although the number of different species of carybdeid medusae in Australian waters that are capable of producing a clinical "Irukandji syndrome" is far from clear at present, these two patients' clinical pictures make the diagnosis of "Irukandji syndrome" fairly certain.

Events subsequent to the use of box jellyfish antivenom show that, although immediate relief of pain appeared to occur, this was not lasting in either case. However, of interest is the fact that in both cases (which could be classed as "severe"), the symptoms lasted less than eight hours, whereas in the experience of the writers, and other documented cases, they usually last 24 hours or more. On the basis of the now quite extensive experience with this antivenom in *Chironex fleckeri* stings and mindful of the well-documented risks of the administration of antivenom, one would require some clearer evidence of benefit to justify its regular use under such circumstances. Further research seems justified.

While it is true that preliminary studies into world jellyfish venom characterisation are beginning to suggest that the venoms of different jellyfish species may contain similar antigenic components, 6, it is much too early to postulate that such similarities imply antivenom cross-reactivity among jellyfish stings by different species. The experience of these case reports counsel against the use of CSL's specific box jellyfish antivenom for the treatment of "Irukandji syndrome" pending further research. Further studies into the immunology of jellyfish venoms subsequently may enable the production of not only more specific antivenom, but conceivably polyvalent antivenom against several jellyfish venoms. However, at the present meagre level of knowledge, and pending such studies, it would be unwise to use *Chironex* antivenom for any jellyfish sting, other than those by either *Chironex fleckeri* or *Chiropsalmus quadrigatus* - two stings whose clinical distinction is academic in any case.

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