

General's Department in each State, the Coroners, and police when they are approached for assistance.

### PROJECT STICKYBEAK

Readers are asked to assist this safety project by contacting the author with information, however tenuous, of serious or fatal incidents involving persons using a snorkel, scuba, hose supply or any form of rebreather apparatus. All communications are treated as being medically confidential. The information is essential if such incidents are to be identified and the causes brought to the attention of those involved in diving safety and diving training.

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### ARE SOME JELLYFISH TOXINS HEAT LABILE?

Geoff Taylor

#### Key Words

Injury, marine animals, toxins, treatment.

#### Abstract

The author reports four episodes of stings from the Jellyfish *Tamoya gigantua*, two of which are his personal experiences. On the second occasion the sting was successfully treated with local heat. This raises the question as to whether other jellyfish toxins are heat labile and could be treated in the same way.

#### Introduction

Jellyfish stings of varying severity are a very common problem for Australians pursuing water sports around our coasts. They vary from the relatively innocuous sting of the Jimble (*Carybdea rastoni*) to the more serious Irukanj syndrome and Box Jellyfish stingers. Local first aid measures that have been recommended for the less severe stings include the use of vinegar, aluminium sulphate (Stingose), lignocaine jelly, papain meat tenderiser and ice.<sup>1,2</sup>

*Tamoya gigantua* is a little known jellyfish that frequents the tropical waters of northern Australia. It is a large box-jellyfish with an elongated box structure and has only four, very short, thick tentacles at each corner. There is commonly a small fish (species unknown) that resides in the bell of the jellyfish. In appearance it superficially resembles a large innocuous comb jelly and does not look like a stinging species. However, the whole body of the animal is covered in nematocysts that pack a powerful punch and can penetrate protective clothing.

#### Case reports

The first case was a bather who had been swimming near the Navy Jetty at North-West Cape, near Exmouth (latitude 21° S) and suffered a powerful sting. A local diver was despatched to investigate any species likely to have caused this injury. He returned with a huge specimen of *Tamoya* whose bell was 22 cm long. No one was game to experiment with this giant and we remained unsure if it was the culprit.

It was several years later that a diving companion recounted his own experience of being stung in 1987 by the same species, on the hand, while diving at Point Cloates on the Ningaloo Reef. He had suffered intense local pain, which spread to his axilla. He felt tightness in the chest making him short of breath. The pain lasted for several hours causing considerable fear and distress. His diving trip was curtailed and the dive boat returned many miles to base-camp.

The next two cases are my own experiences of being stung on two occasions and the successful use of heat to treat the pain of envenomation.

The first occasion occurred on Ningaloo reef in 1994. While swimming in deep water awaiting pick-up by a boat, my left knee struck a sizeable *Tamoya*. The sting penetrated through a lycra bodysuit, causing instantaneous severe burning pain. The pain soon spread to regional lymph glands in the groin, but there were no systemic symptoms. The intense pain lasted for about two hours, and then slowly subsided over the ensuing three hours.

The second event occurred in the same locality, a year later. On this occasion, while snorkelling, my head struck the *Tamoya*, the stingers penetrating my hair (which is surprisingly thick), with extensive stinging over the scalp. At the same time I lifted my hand in a reflex action to fend off the "attacker", and was stung on the back of the hand.

On this occasion it was decided, as an experiment, to try treating the sting with heat. My hand was immersed in a bowl of hot water as hot as I could stand. This brought almost immediate relief of the pain, but initially the pain recurred after removal from the heat. After 20 minutes the

effect of the heat treatment was persisting. However, the pain in the scalp had spread to the neck probably through lymphatic spread. There was an intense burning, and a feeling as if my head was in a vice.

Hot towels were tried and a hot shower, but in the end I was subjected to lying prone on a bench with my head in a bowl of hot water. The relief was very rapid and after 20 minutes the pain had lessened to such a degree that treatment was ceased. Within an hour of being stung I was virtually pain free, and able to resume diving.

## Discussion

The toxins of many marine species are known to be heat labile. These are principally members of the Scorpion Fish and Stingray families. Toxic spine injuries from these species are successfully treated with hot water.

This report suggests that the toxin of the jellyfish *Tamoya* is heat labile and able to be treated with local heat. This raises the question as to whether other species of jellyfish sting can be treated in this way.

The author is now resident in Busselton, Western Australia, on Geographe Bay. This area is well known for its summer plague of "stingers"; the principal species is thought to be the "Jimble" *Carybdea rastoni*. The severity of the sting received by subjects is very variable and some individuals seem to have a hypersensitivity to these stings, with the development of large wheals that take several days to resolve. Others only experience a transient stinging sensation and mild erythema.

Some hypersensitive individuals, who have been told of the benefits of immediate heat treatment, have reported to the author that heat treatment after being stung resulted in considerable improvement of their symptoms.

The *Tamoya* jellyfish is not a life-threatening species and stings with this species are rare. However, my own experience and the reported improvement in symptoms in sting-sensitive individuals who have used heat (hot water) treatment after being stung by unknown jellyfishes in Geographe Bay raises the question that perhaps the pain of more jellyfish stings might be alleviated by immediate heat treatment.

## References

- 1 Edmonds CE. *Dangerous Marine Animals of the Indo-Pacific Region*. Newport, Victoria: Wedneil, 1975; 79-106
- 2 Marsh LM and Slack-Smith SM. *Sea Stingers*. Perth: Western Australian Museum, 1986

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## VALIDATION OF THE RNZN SYSTEM FOR SCORING SEVERITY AND MEASURING RECOVERY IN DECOMPRESSION ILLNESS

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### Key Words

Decompression illness, risk, treatment sequelae.

### Abstract

A retrospective study of 100 divers with a provisional diagnosis of decompression illness (DCI) admitted to the RNZN Slark Hyperbaric Unit from June 1995 to February 1997 inclusive, using the Royal New Zealand Navy (RNZN) scoring system for assessing the severity of DCI and recovery with treatment,<sup>1</sup> was carried out. Only 79 of the divers fulfilled the conditions of entry into the study, 21 being excluded because of doubtful diagnosis, inadequate case notes or a diagnosis of cerebral arterial gas embolism (CAGE). These latter, because of the Unit's protocols, were kept horizontal until under pressure so could not have their standing and walking ability assessed.

The study showed that 59 out of 66 (89.4%) divers with a score of 25 or less ( $\leq 25$ ) on admission had a symptom free recovery after treatment, or a sequelae rate of 10.6% (7 of 66). Of the 13 divers with an admission score of more than 25 ( $>25$ ) only 3 were symptom free after treatment (23.1%) while 10 (76.9%) were left with sequelae.

The RNZN DCI scoring system has good prognostic power. The admission severity score correlates linearly with severity, as indicated by the number of treatments required to achieve maximum recovery, confirming that it is a useful index of severity when assessed at the time of presentation for treatment.

### Introduction

There is a lack of information on prognostic factors in DCI, in contrast to many other conditions, such as the Critically Ill,<sup>2</sup> Head Injury,<sup>3</sup> Meningococcal Septicaemia,<sup>4</sup> Multiple Trauma<sup>5,6</sup> and Acute Pancreatitis,<sup>7</sup> in which epidemiological and clinical studies have elucidated