First Responder

First Response AUSTRALIA

April '06 Newsletter

IN THIS ISSUE:

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New treatment for Bluebottle sting

Thousands of bluebottle (Physalia sp.) stings occur each year in Australia causing immediate, intense pain and discomfort that is usually treated with the application of ice packs.To date, there has been little scientific evidence to support this. A recent randomised trial of "hot water (45 degrees C) immersion versus ice packs for pain relief in bluebottle stings" has turned this established treatment on its head.

Many marine venoms are heat-labile and the researchers suggest it was feasible that heat penetrates the human dermis to the estimated depth that nematocysts inject toxins and recent clinical research suggests heat may be effective for treating jellyfish stings.

Physalia sp. (bluebottle or Portuguese man-o-war)

Jamie Seymour from James Cook University, Cairns and others conducted the trial in Newcastle, NSW with the assistance of Lifesavers over approximately 15 months. Ninety six subjects presented after swimming in the ocean for treatment of an apparent bluebottle sting. Approximately half received ice pack treatment whilst the remainder received hot water immersion treatment

After 10 minutes, 53% of the hot water group reported less pain versus 32% treated with ice. After 20 minutes, 87% of the hot water group reported less pain versus 33% treated with ice. The trial was stopped after the halfway interim analysis because hot water immersion was shown to be effective. Hot water was more effective at 20 minutes in nematocyst-confirmed stings (95% versus 29%). Radiating pain occurred less with hot water (10% versus 30%). Systemic effects were uncommon in both groups.

Characteristic linear erythematous eruption from a bluebottle sting resulting in considerable pain and discomfort

The study concluded that immersion in water at 45 degrees C for 20 minutes is an effective and practical treatment for pain from bluebottle stings.

Again, this research shows us that many of our current first aid techniques are based on assumptions e.g. the use of "pressure immobilisation" in the treatment for Box Jellyfish stings. No doubt in the next few years we will see a lot of "first aid" techniques change.

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Pressure Immobilisation Bandage for snake bite - is it being taught correctly?

In Australia it is estimated that approximately 1-2 deaths occur each year from snakebite. It is believed that up to 2-3,000 envenomations occur annually. About 10% of these envenomations require the administration of antivenom with the majority of these bites occurring in tropical Australia. Although the fatality rate is small compared to the envenomation rate the potential for more deaths exist and concern has been raised regarding the current teaching of first aid for snakebite.

In Nov/Dec 2005 at the Clinical Toxinology Course conducted by the University of Adelaide Faculty of Health Sciences some eminent professors and doctors suggested that the way "pressure immobilastion bandage" (PIB) is taught may well be ineffective. The group proposed to make recommendations to the Australian Resuscitation Council for changes to the technique. It was also pointed out that there have been no comparative studies or clinical trials. The lack of clinical evidence to suggest that pressure immobilisation actually works is controversial.

First lets look at what Australian snakes can do. Australian snakes pocess what is probably the most complex array of venoms. These venoms may produce local tissue damage and/or distinct clinical syndromes, including neurotoxicity, coagulopathy, hypotension, rhabdomyolysis, and renal failure. Field management is aimed at delaying systemic absorption of toxins, minimizing local damage and infection and expediting transport to medical facilities. The use of the pressure immobilisation method remains controversial. The use of antivenom, administered in a timely fashion and in adequate doses, is the mainstay of hospital treatment of significant envenomation. The availability, efficacy and safety of antivenoms vary throughout the world, with a current crisis in antivenom supplies.

Australian elapids are associated with little local necrosis and minimal local pain and bite marks may easily be missed. Local lymph node tenderness and pain, typically within 30 to 120 minutes may portend the later development of systemic envenomation.

Neurotoxins usually cause a progressive generalized neuromuscular flaccid paralysis over 1 to 24 hours, first affecting muscles supplied by cranial nerves (ptosis, ophthalmoplegia, and bulbar palsy) and progressing in severe cases to respiratory muscle paralysis and limb muscle weakness. Patients should be monitored serially for ptosis, diplopia

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(particularly on upward gaze as the earliest sign of ophthalmoplegia), and impaired swallowing function. Ventilatory support may be required for airway protection or respiratory paralysis.

Coagulopathy may result from either activation of the coagulation cascade with a resultant consumptive coagulopathy or from an anticoagulant toxin. Snake toxins may also have a direct toxic effect on vascular basement membranes ("hemorrhagins") or on platelets. Although minor bleeding from gums and nares is common, major bleeding is less common. The presence of coagulopathy may also be a useful clinical feature. In Papua New Guinea, for example, envenomation from the death adder (Acanthophis spp) rarely causes a significant coagulopathy in contrast to that from the taipan (Oxyuranus scutellatus canni).

Rhabdomyolysis (the breakdown of striated muscle) may result from direct myotoxins and is suggested by the presence of muscle pain, weakness and dark urine.

Acute renal failure following a snakebite may also be multifactorial, with common contributing factors including hypotension, rhabdomyolysis, and disseminated intravascular coagulation.

Nonspecific systemic effects. The first clinical indications of systemic envenomation are often nonspecific symptoms such as nausea and vomiting, abdominal pain, and headache.

Understanding the dramatic consequences of envenomation by Australian elapids leads us to what recommendations were made to improve the first aid technique of PIB.

During the presentation, one of the professors mentioned that an ineffective pressure immobilisation bandage had been applied in a real snakebite case - he believed that the bandage was far too loose and used the wrong type of bandage. The photo from the professor demonstrates the bandage used in an actual snakebite case (and which proved, he believed, to be ineffective).

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On the surface, the bandage appears to comply with what is currently being taught - bandage as tight as for a sprain. In fact, as the professor demonstrates in the photo, the bandage is loose.

A number of medicos on the course commented that PIBs often came loose even after apparently being applied in the approved manner. Another change in technique that the course panel and faculty wanted to bring about is that the PIB bandage should first be placed around the bite site. There was also considerable argument about whether the bandage should be applied distal to proximal or proximal to distal. Due to the lack of comparative studies or clinical trials it was postulated that the results seen from PIB may in fact not be due to the "impacting of the lymphatic vessels" but may well be due to the fact that the casualty is inadvertent immobilised and relaxed.

In summary, the panel proposed the following changes:

1. a possible change of name to 'immobilisation-pressure technique' to take into account the importance of immobilisation.
2. a recommendation to start bandaging around the bite site first.
3. a recommendation to use only heavy crepe bandages, minimum width 15 cm.
4. a recommendation to bandage much firmer than for a sprain.

Editor's note:

I'm not too sure where the teaching of "pressure Immobilisation" went wrong, as we (FRA) have always emphasised immobilisation (keeping patient and limb still to prevent muscle pump). Tight bandages using heavy crepe and bandaging the bite site first (as it may be the only bandage you have) and bandaging the distal part of the limb last (to prevent venous distension, leading to discomfort which results in muscle movement). Some venous distension will almost always occur with a tight bandage. Again this emphasises that first aid techniques are often taught with the trainer having a poor understnding of "why".

The Last Word

It has been brought to our attention that there is a concerted effort by some training orgnisations to scare people into believing that due to the dramatic changes that we have seen in resuscitatuion that they "must" immediately enrol into the first available class and not wait until the renewal is due. It seems that there may be an inference that using the older techniques i.e. CPR ratios, may lead to a detrimental outcome.We suggest to our clients that; yes these changes will definitely make it easier to learn and deliver resuscitation but what you may be doing now is not "wrong" - just that it is simply important to remember whatever you do "push firmly and blow carefully"and don't interrupt compressions too much. So to those hard sell merchants out there (and yes we do have them in the "First Aid industry) - shame, shame, shame!

Coming up in the next issue:

* **RES Q POD hits Australia - without doubt the single most important device ever to influence CPR outcomes makes its debut - every resuscitation kit should have one !**
* **Port Douglas liveaboard dive vessel sets the standard in Remote Area Emergency Care - the "Undersea Explorer" has trained up all of its crew in Defibrillation, Advanced Airway Management and Intravenous Fluid Resuscitation - will others follow or wait for the legislative baseball bat?**
* **Can your Defibrillator be upgraded to the new international algorithm - we report on what's required to meet these new guidelines.**
* **Aviation Rescue Fire Fighters use new resuscitation guidelines with amazing results - full report coming up**

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