Is hot water immersion an effective treatment for marine envenomation?

Atkinson P R, Boyle A, Hartin D, McAuley D

CRD summary
This review assessed the effectiveness of hot water immersion for the management of pain from marine envenomation. The authors concluded that hot water immersion was suitable for the treatment of non-life threatening marine envenomation. The reliability of the results, given the lack of validity assessment and poor reporting of the review process, should be treated with caution.

Authors' objectives
To assess the evidence for the effectiveness of hot water immersion or other heat therapies for the management of pain from marine envenomation.

Searching
MEDLINE, EMBASE and CINHAL, plus the British National Formulary and Toxbase databases and the injury, wound and anaesthesia sections of the Cochrane database, were searched. Search dates were not reported. Search terms were reported. Additional studies were sought through handsearching of the bibliographies of obtained articles and through website searches. Unpublished material and conference presentations were sought through contact with investigators in the field.

Study selection
Studies that assessed the treatment of pain caused through envenomation by marine creatures using hot water immersion or other heat therapies were eligible for inclusion. Criteria were not defined for study design or outcomes. Included studies comprised randomised controlled trials (RCTs), crossover studies and case series through to personal communications that assessed hot water immersion in comparison with cold packs and placebo. Participants presented with pain due to marine envenomation, including stings from box jellyfish, blue bottle and from various species of fish. Outcomes in reported studies were measured through pain score reduction and reduced or cessation of pain and an assessment of total treatment time. The authors stated neither how papers were selected for review nor how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity, however, studies were assigned to levels of evidence on the basis of their design.

Data extraction
The authors stated neither how the data were extracted for the review nor how many reviewers performed the data extraction.

Odds ratios (OR) and 95% confidence intervals (CI) were calculated for dichotomous outcomes.

Methods of synthesis
A narrative synthesis was provided, presented in descending order of evidence level from level 1 to level 4.

Results of the review
Sixteen studies were included (n=772): three RCTs (n=254); a randomised crossover trial (n=54); one experimental paired/crossover study (n=6); six case series (n=259 cases); and five review articles (n=199).

Two RCTs and one randomised paired comparison looked at nematocyst-type stings. In one study heat reduced pain scores at five and 10 minutes after application (odds ratio 5.2, 95% CI: 1.3, 22.8, p<0.05) compared with placebo. A second study reported lower pain scores with hot water immersion at four (p<0.001) and 20 minutes (p<0.001). In the final study the trial was stopped because hot water immersion was shown to be more effective (p=0.002) after 20
minutes.

Data from a randomised crossover trial (n=27 in each arm) compared hot showers and ice packs reported that hot showers reduced total treatment time and pain, with complete cessation of pain for 48 per cent (p<0.01) of those treated with hot showers. All of these studies were methodologically flawed.

One experimental paired/crossover study comprised six volunteers in which pain was relieved after 30 minutes of hot water immersion. Six case series studies comprised 259 cases of marine envenomation with 135 cases treated with hot water, from which 122 reported a reduction in pain.

**Authors’ conclusions**
Published evidence supported the use of hot water immersion in the treatment of non-life threatening marine envenomation in conjunction with other established techniques of first aid.

**CRD commentary**
The review addressed a well-defined question and undertook a reasonable search for studies. Attempts were made to retrieve unpublished material. It was unclear whether there were language restrictions. The methods used for study selection and data extraction were not reported, so it was unclear whether methods were used to reduce error and bias. There was limited assessment of the methodological quality of the included studies. A narrative synthesis was appropriate given the heterogeneity between studies. The lack of validity assessment and the poor reporting of the review process may have compromised the reliability of the results of the review and the findings should be treated with caution.

**Implications of the review for practice and research**
The authors did not state any implications for practice or further research.

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