A Systematic Review of Treatment Strategies for Ingested Marine Toxins

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Background:
- Marine toxins are concentrated in contaminated seafood worldwide.
- Marine intoxications can cause neurological, gastrointestinal, and cardiovascular syndromes, potentially leading to high mortality and lasting morbidity.
- With increasing seafood consumption, globalization, and climate change, there is increased risk of exposure to these toxins.
- We aim to synthesize existing evidence around diagnosis, treatment, and prevention of marine intoxications into a clinical resource.

Methods:
- Four electronic databases were searched: PubMed (NCBI), Medline (OVID), EMBASE (OVID), and BioSIS (Web of Science) from database inception to August 2019 using combinations of the search terms ‘marine’ and ‘intoxication’
- Iterative inclusion and exclusion of search terms was employed to maximize article extraction
- The search was refined to humans only
- We included observational studies, case reports, case series, and cohort studies, as well as clinical trials and therapeutics tolerability and efficacy
- Abstracts and full-text articles will be systematically double screened by two reviewers and subsequently by a tertiary arbitrator
- The GRADE approach will be employed to assess quality of studies reporting therapeutic interventions
- Data will be grouped and summarized for ease of clinician use by marine toxin, intoxication syndrome, prevention and therapeutic strategies, and according to geographic location and implicated seafood species.
- Meta-analysis will be planned if sufficient efficacy measures exist

Results: **collated from analysis of 109 abstracts selected for full text review up until November 12, 2019**

Discussion and Conclusion:
- Increased transoceanic movement of people and seafood has facilitated distribution of contaminated seafood to non-endemic regions where clinicians lack familiarity with intoxication syndromes and appropriate treatment.
- Paralytic shellfish poisoning, ciguatera toxicity, and mercury poisoning are common causes of ingested marine intoxication; usually implicated by contaminated shellfish, large predatory reef fish, and tuna respectively.
- By synthesizing the evidence, we hope to inform the development of appropriate management and risk mitigation protocols.

Table 1: Summarized Data of Marine Intoxications from Analyzed Abstracts

<table>
<thead>
<tr>
<th>Intoxication *</th>
<th>Number of Studies *</th>
<th>Median and Range (n) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paralytic shellfish poisoning</td>
<td>50</td>
<td>10-100</td>
</tr>
<tr>
<td>Ciguatera</td>
<td>40</td>
<td>5-50</td>
</tr>
<tr>
<td>Heavy metal toxicity</td>
<td>30</td>
<td>10-50</td>
</tr>
<tr>
<td>Diarrhetic shellfish poisoning</td>
<td>20</td>
<td>5-20</td>
</tr>
<tr>
<td>Tetrodotoxin</td>
<td>10</td>
<td>1-10</td>
</tr>
<tr>
<td>Amnestic shellfish poisoning</td>
<td>5</td>
<td>1-5</td>
</tr>
</tbody>
</table>

References:

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