Examining the Scientific and Regulatory Basis of Treatments for Muscle Cramps
Erica Lee, BS Candidate, Pharmacology and Drug Development; Eunjoo Pacifici, PharmD, PhD

Objectives
Determine the scientific validity and regulatory framework of various products advertised to treat or prevent muscle cramps and work towards creating a product database.

Background
Muscle cramps are a non-fatal but intense pain in the muscles that is estimated to be experienced by 95% of the population\(^1\). Muscle cramps are diverse in who they affect, including physically active individuals, the elderly, pregnant women, and patients with certain medical conditions\(^2,3\). Yet, there are few treatments for this condition.

Methods
1. Products were searched for on Amazon and categorized by broad types before searching up specific product names.
2. Studies for specific products’ effectiveness were searched for on PubMed.
3. Product claims were identified, and warning letters were searched for on the FDA and FTC websites.

Findings
Over 3000 results were found for muscle cramp treatments, with dietary supplements composing the majority of the first 48 results.

<table>
<thead>
<tr>
<th>Product content/active ingredient(s)</th>
<th>Product type</th>
<th>Relevant results</th>
<th>Studies in favor of use</th>
<th>Studies against use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pickle juice</td>
<td>Food</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Apple cider vinegar, ginger juice, garlic juice</td>
<td>Traditional remedy</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Cinchona officinalis &amp; magnesium phosphorica among others</td>
<td>Homeopathic drug</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Magnesium sulfate</td>
<td>OTC drug*</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 1. First Page of Amazon Results for Muscle Cramp Treatments

Conclusions
This findings of research reveal the following:
- The market of muscle cramp products are largely dominated by non-drug products.
- Despite being not allowed under the current US regulatory framework, many muscle cramp remedies on the market make therapeutic claims.
  - “Pickle Juice is the only product on the market scientifically proven to stop muscle cramps.” (pickle juice)\(^4\)
  - “Scientifically proven to prevent muscle cramps with daily use” (magnesium sulfate OTC drug)\(^5\)
  - “Stops leg and foot cramps in about one minute” (traditional remedy)\(^6\)
- Scientific evidence is generally lacking for therapeutic effects claimed by these products.
Considering the ubiquity of muscle cramps, products currently available may be inadequate in fulfilling the therapeutic needs of those affected by the condition.

References

Contact: ericajle@usc.edu