Anger management style is associated with enhanced spinal nociception

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Introduction

Anger management styles have been associated with pain perception.

- Anger-out (outward expression of anger) and anger-in (anger inhibition) have been associated with increased pain sensitivity.

- Two pathways (ascending and descending) contribute to pain perception:
  - The ascending pathway conveys nociception information from the periphery to the brain.
  - The descending pathway conveys information from supraspinal structures to the dorsal horn where it can inhibit or facilitate ascending pain signaling.

- It is believed that activation of the descending-medial pathways may mediate the relationship between anger and pain perception.

- The Nociception Flexion Reflex (NFR), the involuntary reflex that would occur if one stepped on a sharp tool, is a physiological measure of spinal sensitization that is influenced by descending pain modulatory pathways.

- To the best of our knowledge, only Bruehl and colleagues (2007) have investigated the influence of anger expression on the descending pathway of pain using the NFR. In their study, they investigating the effects of anger-out, gender, and opioid blockade effects on NFR threshold and pain responses. Although they did not find an effect of anger-out on NFR threshold, this may have been due to the administration of opioid blockers and the use of a placebo.

- The current study attempts to clarify the role of the descending pathway on the modulatory effect of anger expression on pain perception.

Procedures

- Data were taken from a larger study investigating the relationship between reduction in pain, pain catastrophizing, and measures of nociception.

- In order to replicate experimental manipulations, participants were administered the 20-item Spielberger Anger Expression Scale to quantify trait anger and anger-out.

- During test session, participants partook in various pain procedures including NFR (threshold), temporal summation of NFR and exposure to pain catastrophizing induction (i.e., review of adverse electrocutaneous stimulation) and reducing conditions (i.e., repetition of pain catastrophizing reduction statements).

- NFR threshold was assessed by delivering electrical stimulations to the left ankle over the sural nerve.

- Electrode stimulations increased in 2 mA steps until NFR was obtained and then stimulations decrease in 1 mA steps until no NFR.

- Repeated 2 more ascending/descending staircases in 2 mA steps until NFR appears/disappears 2 more times.

Data Analysis

- Correlations were used to analyze the relationship between the NFR threshold and anger management style. Results indicated there was a significant relationship between anger-out, NFR threshold ($r = -0.255$, $p = .007$), pain ratings ($r = -0.209$, $p = .039$), and between anger-in, and NFR threshold ($r = -0.260$, $p = .006$). However, anger-in was not associated with pain ratings ($r = -0.107$, $p = .267$).

- Pain Ratings and Anger Out

- Pain Ratings and Anger In

Sample Characteristic

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 18 years of age</td>
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<td>43%</td>
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<tr>
<td>AAI-15</td>
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<td></td>
</tr>
<tr>
<td>Current acute illness</td>
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<tr>
<td>Cardiovascular, neurological, and/or circulatory problems</td>
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<tr>
<td>Recent use of anxiolytics, antidepressants, or antipsychotics</td>
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<tr>
<td>Recent psychological trauma</td>
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<td></td>
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<tr>
<td>Chronic pain condition</td>
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<td></td>
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<tr>
<td>Acute/chronic disease</td>
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</tbody>
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- Conclusions

- These results suggest that trait anger management styles (propensities to hold anger in or express it outwardly) are associated with enhanced spinal nociception (as assessed by NFR) and outward expression of anger is also associated with enhanced pain perception.

- These findings suggest a potential link between anger, sensitization at the spinal level and pain modulation at the supraspinal level.

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