Pain Catastrophizing, Pain Intensity and Perceived Injustice Do Not Predict HRV in Acute Pain

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Background and Aims

The nature of chronic pain conditions is well documented, with systemic biological, psychological and social factors interacting in an emergent fashion. Autonomic nervous system dysregulation, reflected as decreased heart rate variability (HRV), is suggested to be a biomarker of systemic dysfunction. Previous research has demonstrated correlations between numerous chronic pain disorders and diminished HRV. The purpose is to determine the relationship between pain and HRV in the acute phase of pain and to examine the predictive value of psychosocial variables on HRV. This study may enhance our knowledge of how early in the pain experience decreased HRV may occur.

Methods

94 subjects completed a survey on an iPad while seated as HRV was collected through a Polar H10 chest strap. The Pain Catastrophization Scale (PCS) and Injustice Experience Questionnaire (IEQ) were used to measure thoughts and behaviors regarding pain. Multiple linear regression was used to test if average pain intensity, thoughts and behaviors regarding pain. Multiple linear regression was used to test if average pain intensity, Average Age, Pain Catastrophing, Pain Intensity, and Perceived Injustice Do Not Predict HRV in Acute Pain

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Patient Demographics

Figure 1: Participant demographics and pain characteristics reported

<table>
<thead>
<tr>
<th>Average Age</th>
<th>Gender</th>
<th>Pain Duration</th>
<th>Worst Pain</th>
<th>Current Pain</th>
<th>Average Pain</th>
<th>Average Heart Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.18 years</td>
<td>76 Male</td>
<td>2.28 weeks</td>
<td>6.8</td>
<td>3.2</td>
<td>3.8</td>
<td>115.0</td>
</tr>
</tbody>
</table>

Figure 2: Statistical significance for pain catastrophization, pain intensity, and perceived injustice to HRV (high/low frequency power).

The overall regression was not statistically significant ($R^2 = .037, p = .348$) and none of the variables contributed significantly to the prediction model. Perceived injustice and catastrophizing demonstrated moderate correlation to each other but no other correlations were found.

Results

Figure 2: Statistical significance for pain catastrophization, pain intensity, and perceived injustice to HRV (high/low frequency power).

Discussion

Despite the correlations between diminished HRV and these variables in chronic pain, the relationship appears to be different in acute pain.

References