Does placebo analgesia inhibit spinal nociceptive processing in healthy participants?: A pilot study
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Introduction
Placebo analgesia is effective pain reduction evoked by an inert treatment mediated by psychological factors. Brain imaging studies suggest that supraspinal regions involved with descending modulation of pain are activated during placebo analgesia, however, evidence for inhibition of spinal nociception is mixed. A previous study failed to show that a physiological correlate of spinal nociception, the nociceptive flexion reflex (NFR), and subjective pain ratings were inhibited by placebo analgesia. However, the previous study used an expectation only manipulation, and a combination of expectation + conditioning (E + C) elicits greater placebo effects. The present study examined whether pain and NFR were inhibited by E + C placebo manipulation. Pain and NFR were tested after two cream applications. The placebo group (E + C) was told that the cream was a powerful painkiller (i.e., Lidocaine), and stimulus intensity was surreptitiously reduced after the 1st cream application. These data were collected as part of a pilot study on placebo analgesia.

Objective
To employ an E + C manipulation to study the effects of placebo on spinal nociception.

Participants

Healthy Pain-Free Individuals: (n = 20)

<table>
<thead>
<tr>
<th>Group</th>
<th>Age (yrs)</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural History (NH)</td>
<td>22.5</td>
<td>4.4</td>
<td>50%</td>
</tr>
<tr>
<td>Expectation + Conditioning (E + C)</td>
<td>25.8</td>
<td>6.5</td>
<td>60%</td>
</tr>
</tbody>
</table>

Exclusion Criteria:
- <18 years of age
- Current acute illness
- Cardiovascular, neurological, and/or circulatory problems
- Chronic pain condition (e.g., migraines, back pain)
- Recent use of analgesic medication
- Current use of anxiolytic and/or hypnotic medication

Methods: Nociceptive Flexion Reflex (NFR)

<table>
<thead>
<tr>
<th>Group</th>
<th>Pain Ratings</th>
<th>NFR</th>
<th>NFR Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH</td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
</tr>
<tr>
<td></td>
<td>(VAS)</td>
<td>(μv)</td>
<td>(μv)</td>
</tr>
<tr>
<td>E + C</td>
<td>45.0</td>
<td>17.5</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Methods: Pain Ratings

Visual Analog Scale (VAS): Pain intensity ratings made following each stimulation using a computer-presented, vertically-oriented scale.

Experimental Procedure

Methods: Nociceptive Flexion Reflex (NFR)

- NH group: no placebo manipulation
- E + C group: told the cream was a powerful painkiller, stimulus intensity was surreptitiously reduced after the 1st cream application

Pain and NFR were tested after two cream applications. The placebo group (E + C) was told that the cream was a powerful painkiller (i.e., Lidocaine), and stimulus intensity was surreptitiously reduced after the 1st cream application. These data were collected as part of a pilot study on placebo analgesia.

Results: Subjective Pain Ratings and NFR

Data Analysis

- Linear mixed model ANOVAs in SPSS 17.0 were used: 2 (Group: NH vs. E + C) x 2 (Time: Pretest vs. Posttest)

Conclusions

Together, these findings suggest that placebo analgesia is associated with the modulation of pain, but not modulation of NFR (i.e., spinal nociception).

However, given the small sample and the non-significant trend towards inhibition of the NFR, caution is warranted in drawing firm conclusions about the effect of placebo manipulations on descending modulation of spinal nociception until the present study can be replicated in a larger sample.

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