Is anxiety sensitivity related to threat-enhanced pain responses?
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Introduction
Anxiety sensitivity refers to a general sense of fear about anxiety-related symptoms (e.g., racing heart, sweating) and can amplify the perception of somatic sensations. Past research has shown that anxiety sensitivity is related to heightened reactivity to pain; however, this work has primarily focused on static measures of pain sensitivity (e.g., pain threshold/tolerance). The present study examined the relationship between anxiety sensitivity and a dynamic measure of pain modulation, i.e., threat-enhanced pain and the nociceptive flexion reflex (NFR; a physiological measure of spinal nociception). Prior to pain testing, the Anxiety Sensitivity Index-Revised (ASI-R) was administered to assess anxiety sensitivity.

Objective
To investigate whether there is a relationship between anxiety sensitivity and threat-enhanced pain outcomes (i.e., pain and NFR).

Participants
Healthy Participants: N = 104
- Characteristics: 44 Women; average age = 28.49 yrs (SD=11.68), White non-Hispanic (78.8%), single (68.3%), average years of education= 14.88 (SD=2.60), and employed (54.8%)
- Exclusion Criteria:
  - 18 years of age
  - BMI=35
  - Current acute illness
  - Cardiovascular, neurological, and/or circulatory problems
  - Recent use of anticoagulant, antidepressant, anxiolytic, or antihypertensive medication
  - Recent psychological trauma
  - Chronic pain condition
  - Raynaud’s disease

Procedures
- Informed consent obtained
- Sensors were applied to the biceps femoris, and stimulating electrodes applied over the sural nerve and on the lower left abdomen
- Anxiety sensitivity was assessed by administering the Anxiety Sensitivity Index-Revised (ASI-R)
- Suprathreshold stimulus intensity was determined by assessing NFR threshold and 3-pulse threshold by serially electric stimulations over the sural nerve. Stimulation intensity was set at 120% of NFR threshold or 120% 3-pulse threshold, whichever was the greater
- Abdominal pain threshold was assessed to determine the intensity of the abdominal stimulation during the threat paradigm
- Participants underwent the threat paradigm (described later)
- Visual Analog Scales (VAS) were administered to assess pain intensity and pain unpleasantness, and NFR magnitudes were recorded

Methods: Electric Pain/NFR Assessment
- Safe Threat

Visual Analog Scale (VAS): Pain intensity and unpleasantness ratings made following each stimulation

Threat/Anticipation Paradigm

Results: Safe vs. Threat Outcomes
- Pain intensity ratings were higher during the threat period, compared to the safe period (p<.05)
- Pain unpleasantness ratings were higher during the threat period, compared to the safe period (p<.05)

Results: Threat-Enhanced Pain/NFR
- Anxiety sensitivity was marginally correlated with threat-enhanced pain unpleasantness (r=0.22; p=.01)
- Anxiety sensitivity was significantly correlated with threat-enhanced pain unpleasantness (r=0.22; p=.01)
- There was no association between anxiety sensitivity and threat-enhanced NFR (r=-.055; p=.29)

Conclusions
- These findings suggest that individuals high in anxiety sensitivity may experience greater pain in a threatening context
- This effect is a result of amplification at the supraspinal level, not the spinal level (given that anxiety sensitivity is not related to NFR)

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