Preliminary evidence for differences in pain pathophysiology in fibromyalgia with and without depression

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Introduction
Fibromyalgia (FM) is a chronic pain disorder of unknown etiology characterized by wide variability in symptom presentation, including pain, sleep, and cognitive symptoms. Additionally, many persons with FM suffer from comorbid depression, which may increase symptom severity and negatively impact treatment in comparison to FM patients without depression. Given the relationship between affect and pain, such that positive affect inhibits pain and negative affect enhances it, it is hypothesized that FM patients with depression would show differential modulation of pain and noceception compared with FM patients without depression.

Objective
To examine whether FM patients with depression exhibit augmented pain responses to electrocutaneous stimulations and show abnormal emotional modulation of pain and noceception in healthy individuals.

Participants
- 10 participants recruited from the community participated (5 FM+depression, 5 FM w/o depression).
- Depression status determined using the Center for Epidemiologic Studies Depression Scale (CES-D).
- Arousal Ratings: 1 (calm) to 9 (excited) and Valence (Pleasure) Ratings: 1 (unhappy) to 9 (happy).
- Self-Assessment Manikin (Bradley & Lang, 1994)
- 'No statistically significant group differences in characteristic variables

Methods: Subjective Emotional Ratings
- FM+depression may also be associated with disrupted modulation of spinal nociception

Method: Nociceptive Flexion Reflex
- Both FM groups showed absence of pain modulation
- FM+depression showed absence of modulation of NFR
- FM, in general, may be associated with decreased supraspinal modulation of pain
- FM+depression may also be associated with disrupted modulation of spinal noceception

Results: NFR & Pain Ratings
- Significant main effect for content (p<.01)
- No significant main effect for depression (p=.20)
- No significant interaction (p=.19)

Conclusions
- Both FM groups showed absence of pain modulation
- FM+depression showed absence of modulation of NFR
- FM, in general, may be associated with decreased supraspinal modulation of pain
- FM+depression may also be associated with disrupted modulation of spinal noceception

Future Directions
- Replicate findings in a larger sample

Methods: Picture Viewing
- Unpleasant Neutral Pleasant
- Pictures from the International Affective Picture System (IAPS, 2006) were chosen that evoke reliable modulation of pain and spinal noceception in healthy individuals.
- Pictures were presented in a pseudorandom order and r-scored for each participant

Method: Nocturnal Electrical Stimulation
- Electrode applied to the ankle over the sural nerve, EMG sensors applied to the biceps femoris muscle
- Stimulation sent to the sural nerve, withdrawal reflex recorded at biceps femoris (EMG)
- NFR reflex occurring 90-150ms post-stimulus
- Participants rate each stimulation from 0—100

Results: Valence & Arousal
- Significant main effect for picture content (p<.01)
- Significant interaction effect for depression by picture content (p<.03), such that FM+depression rated unpleasant pictures as significantly more unpleasant

Data Analysis
A linear mixed model analysis was used to determine group differences in emotional reactions (valence & arousal) to pictures, and to determine the influence of pictures on spinal noceception (NFR) and pain ratings.

Discussion
- FM+depression showed absence of modulation of NFR.
- FM+depression may also be associated with disrupted modulation of spinal noceception.

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