American Pain Society
RESEARCH
EDUCATION
TREATMENT
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B09 Myofascial Pain and Fibromyalgia

(216) Catastrophizing is related to pain modulation in women with fibromyalgia

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Previous research has demonstrated that catastrophizing is related to brain responses to pain in patients with fibromyalgia (FM). Little is known about the influence of catastrophizing on pain modulation in this population. This study examined the relationships between pain catastrophizing and cognitive modulation of pain. Twenty women with FM and 20 age-matched female controls (CO) completed the Pain Catastrophizing Scale, the Beck Depression Inventory (BDI), and underwent functional magnetic resonance imaging of moderately painful heat stimuli, administered alone and during distracting cognitive tasks. Perceptual ratings of pain intensity (PI) and pain unpleasantness (PU) were collected after each stimulus. Relationships between pain catastrophizing and brain and perceptual responses to pain were analyzed with linear regression, controlling for scores on the BDI. There were no significant relationships between catastrophizing and brain responses or ratings during pain processing for either FM or CO ($p>0.05$). For cognitive modulation of pain, significant relationships were found between catastrophizing and both brain responses and ratings for FM and CO. For FM, catastrophizing was significantly related to activity in the bilateral dorsolateral prefrontal cortices ($p<0.05$). For CO, catastrophizing was significantly related to activity in the contralateral postcentral gyri and superior parietal lobules ($p<0.05$). For both groups, partial correlations between PI and PU ratings and catastrophizing were significant, ranging between $r=0.53$-0.79 ($p<0.05$). This study suggests that catastrophizing interferes with pain modulation in both FM patients and controls. However, the brain systems driving these relationships differed. Controls showed positive relationships with catastrophizing and the BOLD response in regions involved in the sensory and attentional aspects of pain while FM patients showed positive relationships with catastrophizing in regions involved in cognitive aspects of pain. These results suggest that therapies aimed at reducing catastrophizing or improving coping may benefit FM patients by improving pain modulation. Supported by a grant from NIAM/NIH AR50969.

(217) Association of body mass index and fibromyalgia symptom severity by gender

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We evaluated the relationship between body mass index (BMI) and fibromyalgia (FM) symptom severity in 10,651 men and women with FM seen at a tertiary medical center who responded to a mailed survey that included demographics, height, weight, and the modified 2010 American College of Rheumatology (ACR) FM Criteria. Respondents were grouped into World Health Organization (WHO) BMI categories. Analysis of variance (ANOVA) and multiple pairwise comparisons with Fisher's least significant differences test were conducted between BMI and fibromyalgia symptoms (FS) for all respondents and separately for men and women. Of survey respondents (n=2499), 93% were female with a mean age of 56.8 ± 13.3 years. BMI distribution of normal, overweight, moderately obese, severely obese, and extremely obese was 29.8%, 29.3%, 20.7%, 12.0%, and 8.2% for the whole sample; 23.9%, 38%, 25.1%, 8.1%, and 4.6% for males; 30.3 %, 28.6%, 20.3%, 12.2%, and 8.4% for females, respectively. Since differences in FS scores were not observed between normal and overweight, the two categories were combined into one group (Group A). Similarly, moderately, severely, and extremely obese were combined into a second group (Group B). Significant differences in FS between Group A and B were found for the sample as a whole ($p<0.001$) and for men ($p<0.05$) and women ($p<0.001$) separately. Our results indicate that BMI is related to fibromyalgia symptom severity in both men and women. To our knowledge, this is the first report assessing the association between BMI and fibromyalgia symptom severity by gender.

(218) Symptoms, physical activity and pain sensitivity in chronic musculoskeletal pain: a comparison of veterans and civilians

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The purpose of this study was to characterize and compare the symptoms, physical activity levels and pain sensitivity of male Gulf War veterans with chronic musculoskeletal pain (GVCMP) to those of female civilians with fibromyalgia (FM). Age-, sex-, and deployment-matched controls were included as reference. Twenty-two GVCMP, 22 veteran controls (GVCO), 43 FM, and 45 female controls (FMCO) completed symptom, mood and personality questionnaires. Participants wore accelerometers for 1 week to measure physical activity. A subset of participants rated pain intensity and unpleasantness in response to 14 thermal pain stimuli (43-49°Celsius). Independent t-tests were conducted to compare the chronic pain groups to each other and their respective controls for each outcome variable. FM and GVCMP were not different ($p>0.05$) with respect to the sensory and intensity aspects of their chronic pain. However, FM reported a greater affective components of their pain and a greater impact of chronic pain on their lives ($p<0.05$). Mood disturbance, anxiety, depression, and pain catastrophizing were also significantly higher in FM versus GVCMP ($p \leq 0.05$). FM performed significantly less moderate intensity physical activity than GVCMP and FMCO ($p<0.05$). Physical activity did not differ between GVCMP and GVCO. FM rated temperatures ≥ 47°C as significantly more intense and unpleasant compared to GVCMP and FMCO ($p<0.05$); GVCMP were not significantly different compared to GVCO ($p>0.05$). Our study demonstrated that although GVCMP and FM patients report similar sensory and intensity qualities of their chronic pain, the affective qualities, impact of pain, and responses to experimental pain differ between these groups. Further, FM patients were more anxious, depressed, likely to catastrophize, and less physically active than GVCMP patients. Despite their similar symptom profiles, there are distinct differences between these two chronic pain conditions, which may be important considerations for treatment strategies. Supported by the DVA and the NIAM/NIH (AR50969).

B11 Neuropathic Pain – Human

(219) HIV-associated distal neuropathic pain is associated with smaller ventral posterior cingulate cortex

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Despite antiretroviral therapy, HIV-associated distal neuropathic pain (DNP) remains one of the most prevalent, disabling and treatment-resistant complications of HIV disease, affecting approximately 20% of patients. Distal sensory neuropathy (DSP) is defined clinically by the presence of abnormal signs on clinical examination. Only a subset of HIV+ individuals with evidence of distal sensory nerve injury by clinical examination experiences DNP. This suggests that some other influence, such as alterations in the CNS processing of afferent sensory information, may modify the phenotypic expression of DSP. We hypothesized that brain pain processing regions would show smaller regional volumes in HIV patients with DNP compared to HIV patients without DNP. To investigate this hypothesis, we performed a cross-sectional analysis of structural magnetic resonance images in 236 HIV-infected participants (66 with DNP and 170 without DNP) from an observational multi-site cohort study at five US sites (CNS HIV Antiretroviral Treatment Effects Research Study, CHARTER). Using standardized ratings and semi-structured interviews, study clinicians classified DNP (burning, aching, or shooting) into five categories of severity: none, slight (occasional, fleeting), mild (frequent), moderate (frequent, disabling), and severe (constant, daily, disabling). The association between DNP and regional cortical volumes was investigated using permutation-based multivariable regression controlling for demographic and clinical factors (age, site, ethnicity, gender, skull volume, drug abuse, and neurocognitive impairment). For these 236 subjects, 101 showed no signs of peripheral neuropathy (9 of these subjects reported DNP), 68 showed 1 sign of neuropathy (20 of these reported DNP), and 67 reported 2 or more signs of neuropathy (37 of these reported DNP). We found that HIV-associated DNP is significantly correlated with smaller regional brain volumes in the left ventral posterior cingulate cortex ($p=.035$; MNI coordinates $x=-6$, $y=-52$, $z=20$). These results are consistent with previous chronic pain structural brain imaging research.