Conditioned pain modulation, central sensitivity syndromes and psychological characteristics in individuals with chronic multi-site musculoskeletal pain– A pilot investigation

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Chronic multi-site pain

- Chronic multi-site pain is a prevalent condition with a range of disabling physical and psychological symptoms
- Central nervous system changes have a key role in generation and maintenance of chronic musculoskeletal pain syndromes
- Central Sensitivity Syndromes (CSSs), which refer to a group of medically-indistinct disorders for which no organic cause can be found, may co-exists along with multi-site pain.
- Impaired conditioned pain modulation has been demonstrated in a range of regional musculoskeletal conditions (e.g. chronic low back pain, knee osteoarthritis)
- Psychological profiles and CSSs may influence the extent of descending pain modulatory function
- However, descending pain modulatory function in patients with multi-joint pain is currently unknown.

Aims

To explore the efficiency of descending pain inhibitory function in a sample of individuals with chronic multi-site joint/region pain, & to characterize psychological and central sensitivity syndromes in individuals with chronic multi-site musculoskeletal pain.

Methods

Participants

- **Inclusion criteria:** 25 individuals with chronic multi-site/region pain in the age group of 50 -75 years
- **Exclusion criteria:**
  - Rheumatoid/ inflammatory/ infective arthritis
  - Underwent joint replacement or surgeries
  - Brain injury or disease (e.g. Stroke and Multiple Sclerosis)
  - Spinal cord injury or disease
  - Spinal cord deformities including spinal canal stenosis
  - Nerve injuries or disease in the limbs (having sensory loss and muscle weakness)
  - Heart disease and uncontrolled hypertension
  - Skin conditions

Conditioned Pain Modulation protocol*

Pre test stimulus: Two trials of pressure pain threshold using computarized pressure algometer (AlgoMed)

Conditioning stimulus: Cold presser test: Immersion of hand in cold water (12 deg) for 2 mins

Post test stimulus: Three trials of pressure pain threshold immediately after cold immersion (30s, 60s and 90s)

Questionnaires*

*Conditioned pain modulation and questionnaire data were collected with respect to the most symptomatic joint.

Results

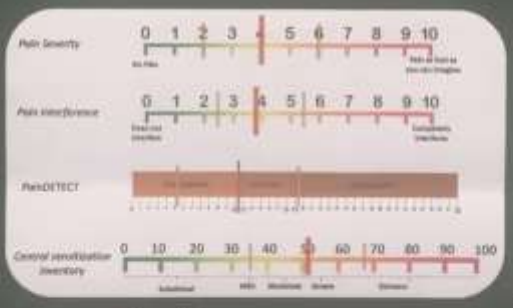
Participant characteristics

Variable	Mean ± SD
Age (years)	64.3 ± 8.6
BMI (kg/m^2)	28.0 ± 4.3
No. of painful joints/regions (Median)	4
General health (%)	67.6 ± 17.5

Psychological profiles

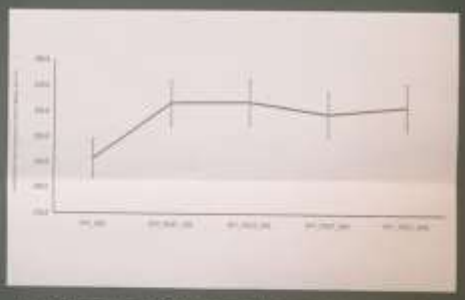
Variable	Mean ± SD
Pain catastrophizing levels	13.2 ± 10.8
Pain hypervigilance and awareness	38.0 ± 3.3
Depression	3.6 ± 3.7
Anxiety	3.2 ± 2.9
Stress	6.5 ± 4.1
Coping strategies	18.7 ± 4.1
Chronic pain acceptance	28.3 ± 5.5
Pain self efficacy	9.2 ± 1.7
Illness perceptions	39.6 ± 10.2

Pain profiles and Central sensitivity



Mean | SD

Conditioned Pain Modulation*



Paired Student T test: *p≤0.05; however the mean difference is smaller than the standard error of measurement (SEM) absolute value (42.2 kPa) which was derived from pre-test stimuli scores.

Conclusions

- Positive CPM effect has been observed, however it is not a meaningful effect.
- Higher scores of CSI (>40) indicates the presence of central sensitivity syndromes in this sample
- Higher levels of confidence (pain self-efficacy) in functioning were evident despite the presence of pain.
- Results must be interpreted with caution due to small sample size, introducing a sampling bias.
- Ongoing research with a larger sample size will provide findings that can be generalized to wider population

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