What Key Clinical, Psychological and Neurophysiological Factors Predict the Magnitude of Exercise Induced Hypoalgesia in Individuals with Knee Osteoarthritis?

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Age, **anxiety** and **expectations** are associated with the ability to modulate pain during an exercise session in people with knee OA.

Introduction

Prior research indicates that individuals with knee OA exhibit higher levels of exercise induced hypoalgesia (EIH) variability[1]. The influence of clinical, psychological, and neurophysiological factors on the EIH response remains unclear.

Aims

This cross-sectional study examined potential clinical, psychological and neurophysiological predictors of the magnitude of EIH in individuals with knee OA

Methods

119 people (age 68±10 years) with knee OA completed a test of EIH. Participants completed baseline demographic and psychological questionnaires (HADS, PCS, TSK, CSI) as well as a measure of expected change in pain. Following this, quantitative sensory testing was completed, including measures of temporal summation, conditioned pain modulation and offset analgesia.

For the test of EIH, participants completed a single submaximal isometric contraction, at a target force of 25% of maximum voluntary contraction until failure. Pressure pain thresholds (PPT) were completed before and immediately after the exercise at the knee (local EIH) and the contralateral forearm (remote EIH). Linear regression analysis was utilised to explore which variables predict the magnitude of EIH, while linear mixed regression was used to determine what portion of the variance in EIH was explained by the observed variables.

Results

The magnitude of EIH was larger at the knee than the arm ($p < 0.001$). Of the observed variables, only age, anxiety and expected change in pain were associated with the magnitude of EIH (all $p < 0.05$). However, together these variables accounted for <10% of the total variance in EIH. A large amount of the remaining variance was due to individual and test site (knee, forearm) related differences.

Discussion

The lower magnitude of EIH observed in older participants may reflect the decline of endogenous pain modulation associated with aging. Additionally, lower anxiety and higher expected change in pain were found to be associated with a greater EIH response indicating that psychosocial variables may affect the ability to modulate pain through exercise. Moreover, large between-participant and between-location variance suggests that there is still a significant space for exploration of additional clinical variables which may eventually explain differences in the EIH response.

Conclusion

Lower age, low anxiety and a high expected change in pain were associated with a greater magnitude of EIH in people with knee OA. Further research is warranted to explore the effects of interventions targeting anxiety and expectancy on EIH response in knee OA.

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References:

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