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What key clinical, psychological and neurophysiological factors predict the magnitude of exercise induced hypoalgesia (EIH) in individuals with knee osteoarthritis (OA)?

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Prior research indicates that individuals with knee osteoarthritis (OA) exhibit more variable exercise induced hypoalgesia (EIH) that can lead to flares in pain, adversely affect exercise adherence and limit exercise related pain relief. This cross-sectional study explored potential clinical, psychological and neurophysiological predictors of the magnitude of EIH in individuals with knee OA. 119 men and women (mean age 68 10) with knee OA completed baseline clinical tests, psychological questionnaires (e.g anxiety, depression, catastrophising, kinesiophobia, expectations) as well as measures of pain sensitisation using standardised quantitative sensory testing. Before and immediately after a bout of isometric resistance exercise, pressure pain thresholds (PPT) were completed at the knee (local EIH) and the contralateral forearm (remote EIH). Linear regression analysis was utilised to explore which variables predicted the magnitude of EIH (change in PPT), while linear mixed regression was used to determine what portion of the variance in EIH was explained by the observed variables. 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. Age, anxiety and expected change in pain were associated with the magnitude of EIH in people with knee OA. 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. This may be important in order to design more effective exercise-based interventions for people with knee OA.

Keywords
Knee osteoarthritis; exercise induced hypoalgesia; exercise; rehabilitation