

EXPERIMENTAL PAIN AND PSYCHOLOGICAL DIFFERENCES BETWEEN INDIVIDUALS WITH EARLY AND END-STAGE CARPOMETACARPAL OSTEOARTHRITIS



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Psychological assessment questionnaires

Mann Whitney U Test was performed to compare the psychological variables. p < 0.05 were deemed significant

Participants with end stage OA reported higher pain and functional disability.



individuals age, they experienced **decreased sensitivity**. As Particularly, during pressure pain threshold testing, participants with end-stage OA had steeper slopes in almost all tested sites.

Interestingly, the relationship between mechanical stimuli and age varied between groups for the contralateral thenar and quadriceps sites.



End-stage OA is associated with significantly higher levels of pain and disability compared to early-stage OA. This can severely impact the quality of life of affected individuals.

Individuals with end-stage OA also suffer from an overall loss of function, including a loss of sensitization across sites. This underscores the urgent need for early intervention and effective management strategies to prevent OA from progressing to end-stage.

Although significant differences were detected in our linear mixed model, they were lost after post-hoc correction because of the small sample size and numerous testing sites. However, we were still able to observe trends.

Quantitative Sensory Testing (QST)

VDT and PPT variables were log-transformed. QST variables were z-transformed with early OA used as the control. Linear mixed models were performed on the experimental pain variables. p < 0.05 were deemed significant

Participants with end stage OA experience a loss of function when compared to individuals with early-stage OA.





Individuals with early-stage OA had a decrease in cold pain threshold (i.e., higher temperature), with exception of the affected thenar site, versus individuals with end-stage OA who experienced the opposite. Yet the **pain rating** for both groups **increased as age** increases.



Our findings suggest that there may be significant differences in pain perception among different stimuli. These findings offer valuable insights into the impact of OA on specific sensory fibers and can inform/improve current treatment strategies.

	Type of sensory fiber	Presence of myelinated axons	Diameter (µm)	Sensory information conveyed
	Αβ	Yes	6-12	Discriminative sensitivity to mechanical stimuli (touch, vibration)
5	Αδ	Yes	1-5	Sensitivity to cold and pain
	С	No	0.3-1.5	Sensitivity to heat and pain

This is the first study to assess somatosensory differences using mechanical and thermal stimuli in a population prior to any surgical treatment.

Limitations:

Our study excluded participants with upper extremity musculoskeletal disorders (i.e., carpal tunnel, rheumatoid arthritis, etc.). However, some participants reported having knee OA or pain in other body regions (see 'number of pain

sites'), which may have impacted our findings. Most participants reported having bilateral CMC OA, making it impossible to compare "healthy" to osteoarthritic body sites within subjects.

Future work: Increase the number of participants and include male participants. Examine differences if participants were grouped based on symptomatic OA versus asymptomatic OA.

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