SENSITIZATION TO TONIC HEAT PAIN IS REDUCED BY CONDITIONED PAIN MODULATION FROM NOXIOUS COLD

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INTRODUCTION / AIM

Subjectivity in perception and interpretation of tonic heat evoked pain, although critical in the assessment of psychological factors related to chronic pain, may confound studies which intend to address physiology that can be largely independent from the aforementioned factors. Conventional rating-based techniques of assessing tonic heat, have largely failed to identify an effect of conditioned pain modulation (CPM) on the temporal summation of pain. To this end, we introduce a more objective method for quantifying sensitivity and adaptation to pain elicited from tonic heat.

METHODS

After the initial application of 45 degrees Celsius to the C6 dermatome of 20 participants, they were given online control of the applied temperature with instructions to keep the initial sensation of pain constant. The result is a measure of temperature over time which can represent participants’ sensitivity, adaptation, and sensitization to the stimulus. Participant control of temperature (over the course of 2 minutes) revealed a clear pattern of adaptation to and summation of pain that was reliably observed in individual trials.

RESULTS

Sensitization but not adaptation to heat pain was reduced by conditioned pain modulation (from noxious cold stimulation in the opposite hand). This reduction in sensitization was observed more readily in male than female participants.

DISCUSSION / CONCLUSIONS

The observed effect of temporal summation of pain may represent an interaction of pro- and anti-nociception at the spinal level. We foresee that tonic sensation will be used in combination with electrophysiology and imaging tools to more comprehensively study nociception with greater precision.

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