

Patterns of Change in Perception of Imagined and Physically Induced Pain over the Course of Repeated Thermal Stimulations

Authors : Boroka Gács, Tibor Szolcsányi, Árpád Csathó

Abstract : Background: Individuals frequently show habituation to repeated noxious heat. However, given the defensive function of human pain processing, it is reasonable to assume that individuals imagine that they would become increasingly sensitive to repeated thermal pain stimuli. To the best of the authors' knowledge, no previous studies have, however, been addressed to this assumption. Therefore, in the current study, we investigated how healthy human individuals imagine the intensity of repeated thermal pain stimulations, and compared this with the intensity ratings given after physically induced thermal pain trials. Methods: Healthy participants (N = 20) gave pain intensity ratings in two conditions: imagined and real thermal pain. In the real pain condition thermal pain stimuli of two intensities (minimal and moderate pain) were delivered in four consecutive trials. The duration of the peak temperature was 20s, and stimulation was always delivered to the same location. In each trial, participants rated the pain intensity twice, 5s and 15s after the onset of the peak temperature. In the imagined pain condition, participants were subjected to a reference pain stimulus and then asked to imagine and rate the same sequence of stimulations as in the induced pain condition. Results: Ratings of imagined pain and physically induced pain followed opposite courses over repeated stimulation: Ratings of imagined pain indicated sensitization whereas ratings for physically induced pain indicated habituation. The findings were similar for minimal and moderate pain intensities. Conclusions: The findings suggest that, rather than habituating to pain, healthy individuals imagine that they would become increasingly sensitive to repeated thermal pain stimuli.

Keywords : habituation, imagined pain, pain perception, thermal stimulation

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