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Pinprick-induced gamma-band oscillations are not a useful electrophysiological marker of pinprick hypersensitivity in humans

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Abstract
Objective: This study aimed to investigate scalp gamma-band oscillations (GBOs) induced by mechanical stimuli activating skin nociceptors before and after the induction of mechanical hypersensitivity using high-frequency electrical stimulation (HFS) of the skin. Methods: In twenty healthy volunteers, we recorded the electroencephalogram during robot-controlled mechanical pinprick stimulation (512 mN) applied at the right ventral forearm before and after HFS. Results: HFS induced a significant increase in mechanical pinprick sensitivity, but this increased pinprick sensitivity was, at the group level, not accompanied by a significant increase in GBOs. Visual inspection of the individual data revealed that possible GBOs were present in eight out of twenty participants (40%) and the frequency of these GBOs varied substantially across participants. Conclusions: Based on the low number of participants showing GBOs we question the (clinical) utility of mechanically-induced GBOs as an electrophysiological marker of pinprick hypersensitivity in humans. Significance: Mechanical pinprick-induced scalp GBOs are not useful for evaluating mechanical pinprick hypersensitivity in humans. © 2023 International Federation of Clinical Neurophysiology

Author Keywords
Clinical; Electro-encephalography; Gamma-band oscillations; Pinprick hypersensitivity; Robot-controlled mechanical pinprick stimulation

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