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1520 Effect of Topical Capsaicin on Corticomotor Control of Tongue Musculature

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Recent studies with transcortical magnetic stimulation (TMS) have demonstrated facilitation of motor evoked potentials (MEPs) in human tongue musculature following fatiguing training tasks, but the potential contribution of sensory afferent inputs is unknown. Objectives: To test the effect of capsaicin stimulation on tongue MEPs. Methods: Fourteen volunteers participated (21-30 years) in one session; before, during topical capsaicin application (5 ug/ml) on the tongue, and 30 min afterwards. EMG electrodes were placed on the tongue and the first dorsal interosseous (FDI) muscle (control). EMG signals were amplified, filtered (20 Hz - 1 kHz), and sampled at 4 kHz (Nicolet, USA). TMS were delivered with a figure-of-8 coil (Magstim 200, UK). Scalp sites at which EMG responses were evoked in the relaxed tongue or FDI at the lowest stimulus strength were determined, i.e., motor threshold (MT). MEPs were assessed using stimulus-response curves in steps of 10% MT. Eight stimuli were presented at each stimulus level. The proximal hypoglossal nerve was activated by TMS delivered over the parieto-occipital skull distal to the right ear. Eight stimuli were delivered at 50% of maximum stimulator output. ANOVAs were used to analyse latency and peak-to-peak amplitudes. Results: Capsaicin evoked mild pain (2.8 ± 0.5), and a strong burning sensation (6.2 ± 0.4) on 0-10 rating scales. MEP amplitudes in tongue and FDI were not influenced by capsaicin ($P > 0.44$) but by stimulus strength ($P < 0.001$). MEP latencies in tongue (8.9 ± 0.2 ms) and FDI (22.4 ± 0.4 ms) were not affected by capsaicin ($P > 0.19$). Hypoglossal nerve stimulation evoked short-latency (3.6 ± 0.9 ms) response (mean amplitude 120 ± 47 uV); but was unaffected by capsaicin ($P > 0.54$). Conclusion: No direct effect of a strong burning sensation could be shown on peripheral or central corticomotor pathways to the relaxed tongue musculature.

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