

Glyceryl trinitrate (GTN)-induced headache is affected by priming of trigeminal system

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Background: Infusion of glyceryl trinitrate (GTN) in migraine patients provokes an immediate headache that often is followed by a delayed phase with characteristics of a migraine attack. However, in healthy volunteers, only an immediate headache that is less severe and shorter than migraine patients occurs following administration of GTN. The higher sensitivity of nervous system in migraine patients has been proposed to underlie their more intense and prolonged GTN-evoked headaches. We tested the hypothesis that in healthy humans, a priming pain stimulus would enhance or prolong GTN-evoked headache. Methods: Three priming stimuli, chemical stimulation by capsaicin patch, mechanical stimulation by a custom-made headband, or a combination of the two, were used prior to administration of sublingual GTN (0.5 mg) to induce headache in healthy volunteers (N=20; age: 26.2±4.0 years). Headache pain characteristics and responses to a battery of quantitative sensory tests were assessed. Statistical analysis was performed with STATA using the paneled regression model and post estimation tests. Results: GTN-induced headache intensity was significantly higher (P<0.0001) after the combined stimulation when compared either chemical or mechanical stimulation alone. Combined stimulation also produced the largest pain area. Increased sensitivity to noxious mechanical and thermal stimulation was produced by the priming stimuli; however, administration of GTN did not further increase this sensitization. Conclusions: The findings confirm that pain sensitization in healthy subject's increases the intensity of GTN-evoked headaches. This combined surrogate model of headband-capsaicin-GTN might be useful to study features of trigeminal sensitization in humans that occurs in pathological craniofacial pain conditions.