

Influences of hypnotic suggestibility, automaticity, pain expectation, and EEG alpha on placebo analgesia responsiveness

Vilfredo De Pascalis, Paolo Scacchia, Arianna Vecchio
Department of Psychology, La Sapienza University of Rome, Italy

We tested the role of hypnotic suggestibility, automaticity, pain expectation, and subjective hypnotic depth in the prediction of placebo analgesia (PA) responsiveness. We also tested the link of lower and upper alpha sub-band (i.e., ‘alpha1’ and ‘alpha2’) power changes with tonic PA responding during waking and hypnosis conditions. Following an initial PA manipulation condition, we recorded EEG activity during waking and hypnosis under two treatments: (1) painful stimulation (Pain); (2) painful stimulation after application of a PA cream. Alpha1 and alpha2 power were derived using the individual alpha frequency method. We found that (1) PA in both waking and hypnosis conditions significantly reduced relative pain perception; (2) during waking, all the above mentioned contextual measures were associated with pain reduction, while automaticity alone was associated with pain reduction within hypnosis. Enhanced alpha2 power at the left-parietal lead was solely associated with pain reduction in waking, but not in hypnosis condition. Using multiple regression and mediation analyses we found that: (i) during waking, the enhancement of relative left-parietal alpha2 power, directly influenced the enhancement in pain reduction, and, indirectly, through the mediating positive effect of automaticity; (j) during hypnosis, the enhancement of left-temporoparietal alpha2 power, through the mediation of automaticity, influenced pain reduction. Current findings obtained during waking suggest that enhanced alpha2 power may serve as a direct-objective measure of the subjective reduction of tonic pain in response to PA treatment. Overall, our findings suggest that placebo analgesia during waking and hypnosis involves different processes of top-down regulation.