EMOTIONAL FACTORS CONTRIBUTE TO THE REDUCTION OF PAIN AFTER ADMINISTRATION OF A PLACEBO

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Objectives: Placebo analgesia refers to the observation that pain is often reduced after administration of a placebo with information that it contains a powerful painkiller. The information has been found to generate an expectation of reduced pain, hypothesized to activate descending, endorphin mediated pain inhibitory mechanisms. This series of experiments tested the idea that reduced stress and negative emotions mediate the effect of the expectation of pain relief.

Methods: In all studies, placebo analgesic responding was defined as the difference in pain levels between a group or condition where subjects received inactive treatment with information that it reduced pain, and a group or condition where no treatment and no information was administrated. Pain was induced in healthy volunteers via a thermode where temperatures were increased (Experiments 1-4) or decreased (Experiment 5) to painful levels. Pain was recorded by visual analogue scales (VAS), by event related potentials (ERPs), or heart rate variability. Emotions were recorded by VAS and the Fear of Pain Questionnaire. Expectations were induced via information (Experiment 1-4) or via a classical conditioning procedure where pain levels were reduced after administration of placebo capsules to induce an expectation of reduced pain after intake of the capsules (Experiment 5). Placebos were capsules containing lactose (Experiments 1,2,4,5) or other procedures that could affect pain (diffuse noxious inhibitory control, Experiment 3).

Results: Information that a painkiller had been administrated reduced pain and event related potentials to painful stimulation. Regression analyses found that high levels of stress or negative emotions prior to onset of the experiment, predicted reduced placebo analgesia. Individuals that were fearful of pain had higher stress levels, more pain, and displayed reduced placebo analgesia. Increased pain after placebo administration was observed in some of these individuals. Fear of pain predicted event related potential amplitude.

Conclusions: Placebo responses could be seen in subjective and neurophysiological response to painful stimulation. Higher levels of negative emotions prior to painful stimulation reduced placebo analgesic responding, and subjective stress levels were lower in subjects receiving placebo compared to subjects not receiving any treatment. Thus, reduced negative emotions could be one mechanism in placebo analgesia.

Publications:


**Keywords:** Placebo effect, placebo analgesia, pain, event related potentials, emotion.