

fMRI to Investigate the Effect of Pleasant Chill-Inducing Music on Acute Pain in Healthy Volunteers

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Abstract

BACKGROUND: The experience of chills, or thrills, is characterized by tingling sensations produced by emotionally arousing stimuli. Existing evidence indicates that chill-inducing music instills pleasant sensations in its listeners by activating the reward circuitry in the brain.

AIM: This study investigates whether pleasant chill-inducing music has the ability to alter the neural circuitry associated with acute pain.

HYPOTHESES: It is hypothesized that pain tolerance and pain threshold would increase when participants listen to pleasant chill-inducing music as compared to when they listened to the control conditions. Additionally, it is hypothesized that participants' ability to decrease sensory and emotional aspects of acute pain is greater when they listen to pleasant chill-inducing music as compared to the control sounds.

METHODS: Pain threshold and pain tolerance are determined at baseline using thermal heat stimuli in twelve healthy participants. Participants then undergo an fMRI scan to examine their perception of pain and their brain's response to painful stimuli while listening to their choice of pleasant chill-inducing music and two control conditions. By applying painful stimuli (noxious thermal heat rated by Visual Numerical Scale, VNS, of pain intensity and unpleasantness) and observing brain function as examined by functional magnetic resonance imaging (fMRI), the effects of pleasant chill-inducing music on the brain's pain matrix and reward systems are explored.

RESULTS: Data from five out of twelve participants have been analyzed to date. Changes in activation in regions of the pain neuro-matrix such as the primary and secondary somatosensory cortices (S1 and S2), anterior cingulate cortex (ACC), and insula (IN), as well as the parahippocampal gyrus has been observed during chill-inducing music as compared to the control conditions. Pain sensation was reported to decrease during chill-inducing music.

CONCLUSION: These results suggest that chill-inducing music has the potential to inhibit pain sensation.