EDITOR'S CHOICE ARTICLE

ANALGESIC EFFECT OF DANCE MOVEMENT THERAPY

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Exercise-induced hypoalgesia (EIH) is a phenomenon characterized by a decrease in sensitivity to nociceptive stimuli during exercise, but also for a period of time afterwards. It is speculated that the induction of good cognitive function and positive emotions plays a crucial role in the analgesic effect of exercise. The prefrontal cortex is the part of the brain which is involved in pain processing.

In 2022, a group of scientists from the Shanghai University of Sports conducted a study which aimed to explore physiological mechanisms of hypoalgesia caused by dance movement therapy (DMT). The study involved 97 healthy individuals who were randomly divided into three groups: a single DMT group, a double DMT group and a control group. The tests were conducted before and after DMT which lasted for 30 minutes (the control group sat still during this time). For one hour after intervention the participants were required to sit still and then underwent the third set of tests. The tests included the pressure pain threshold test at 10 different muscle points on the body, the self-assessment manikin, a pictorial questionnaire that measures a person's affects and feelings, and the color-word Stroop task, which is a cognitive test. The participants were wearing functional near-infrared spectroscopy (fNIRS) head devices while solving the color-word Stroop task. The fNIRS is a non-invasive neuroimaging technique which measures changes in oxy- and deoxyhemoglobin concentrations by collecting information on the reflected light and thus estimates cortical hemodynamic activity in response to the neuronal activation of a certain part of the cortex. The results revealed an increase in the pressure pain threshold values of 10 test points throughout the whole body in the experimental group. The improvement effect was still present one hour after intervention. Compared to the control group, the experimental group showed significantly higher levels of pleasure and arousal, which returned to baseline one hour after DMT. The cognitive improvement was insignificant. The fNIRS data revealed that DMT significantly activates the bilateral dorsolateral prefrontal cortex and left ventrolateral prefrontal cortex. The correlation analysis indicates a positive relationship between arousal level, execution function accuracy and prefrontal cortex activation. It also suggests that an increase of prefrontal cortex activation (measured by oxyhemoglobin concentration) may be a key factor in enhancing pain tolerance.

This research provides a new insight into the neurophysiological mechanism of EIH, mediated by DMT, through enhancing the descending pain inhibitory pathways: the dorsolateral prefrontal cortex-ventrolateral-periaqueductal gray-rostral medial medulla pathway and basolateral amygdala-dorsolateral prefrontal cortex-periaqueductal gray pathway. However, the participants of this study were only healthy individuals, not those suffering from chronic pain. Since pain stimuli are only mechanical pressures, there is a possibility of using several neuroimaging methods together in order to get more accurate results. Nevertheless, it is an important step towards a multidisciplinary treatment of chronic pain.

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