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Role of opioid receptors signaling in electroacupuncture-induced protection against ischemia/reperfusion injury in rat hearts

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Aims: Our previous studies demonstrated that electroacupuncture (EA) increased myocardial GSK3 phosphorylation and attenuated ischemia/ reperfusion (I/R) injury in rat hearts. However, the role of various opioid receptors (OR) subtypes in preconditioned RES-induced myocardial protection remains unknown. We investigated the role of OR subtype signalling in EA-induced cardioprotection against I/R injury of the rat heart.

Methods: Male Spraque-Dawley rats were used. EA was performed on median nerves area with/without pretreatment with various receptors antagonists such as opioid receptor (OR) subtype receptors (KOR, DOR, and MOR). The expressions of Akt, GSK3, and PKC ϵ expression were analyzed by Western blotting. When EA was preconditioned before the I/R model, the rat's hemodynamic index, infarction size, mortality and serum CK-MB were evaluated.

Results: Our results showed that Akt, GSK3 and PKC ϵ expression levels were significantly increased in the EA group compared to the sham group, which were blocked by pretreatment with specific antagonists targeting KOR and DOR, but not MOR subtype. Using I/R model, the duration of arrhythmia and infarct size were both significantly attenuated in EA group. The mortality rates of the sham EA group, the EA group, EA group + KOR antagonist, EA group + DOR/MOR antagonists (KOR left), EA group + DOR antagonist, and EA group + KOR/MOR antagonists (DOR left) were 50%, 20%, 67%, 13%, 50% and 55%, respectively.

Conclusion: The mechanism of EA-induced myocardial protection against I/R injury seems to involve multiple target pathways such as Akt, KOR and/or DOR signalling.

Biography

Jen-Hwey Chiu is a Professor of Institute of Clinical Medicine and Institute of Traditional Medicine, School of Medicine, National Yang-Ming University, Taiwan, ROC. The expert fields include studies of acupuncture mechanisms, protective mechanisms of acupmoxa against ischemia-reperfusion injury of the heart, cancer biology and recurrent mechanisms of triple negative breast cancer.

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