

Morphine pre- and post-conditioning exacerbates apoptosis in rat hippocampus cells in a model of Homocysteine induced oxidative stress

Amin Ataie

University of Medical Sciences Babol, Iran



Received: January 25, 2022, Editor Assigned: January 27, 2022, Reviewed: March 26, 2022, QC No. COS- AA0001;
Proceeding No: Volume: 10, 2022 Published: April 05, 2022, Invoice No. JND-0000F1

Abstract

Recent investigations indicated that morphine has protective effects in different ischemia/reperfusion models and may protect against neuronal cell death, while other evidence showed that morphine induces apoptosis in neurons. Therefore, the current study was conducted to investigate pre and post conditioning effects of morphine on hippocampal cell apoptosis in a rat model of homocysteine (Hcy) induced oxidative stress. In the present study, 0.5 $\mu\text{mol}/\mu\text{l}$ Hcy was injected into bilateral intrahippocampal in the rat brain and morphine at a therapeutic dose of 10 mg/kg was injected intraperitoneally 5 days before and after Hcy injection in rats. The left and right rat hippocampus was removed for biochemical and histopathological analysis. In addition, hippocampal cell apoptosis was assayed by the TUNEL kit. Our results indicated that malondialdehyde (MDA) and superoxide anion (SOA) levels in the Hcy group were increased significantly compared to the control group ($P<0.001$). In addition, morphine pre- and post-treatment increased the MDA and SOA levels significantly in rat hippocampus compared with other groups ($P<0.001$). It was found that Hcy alone induced apoptosis in hippocampus cells and significantly increased the number of TUNEL positive cells in rat hippocampus compared to the other group ($P<0.001$). Notably, our results indicated that pre and post treatment by morphine increased apoptosis in hippocampus cells compared with the other group ($P<0.001$). In conclusion, morphine neuroprotection and neurotoxicity needs to be further investigated to determine morphine side effects in medical applications and to identify new targets for potential therapies

Biography

Amin Ataie is PharmD, PhD in pharmacology from Shahid Beheshti University of Medical Sciences in 2009 as followings with H-index 8, He is researcher of neuroscience center of Babol University of Medical Science He has Experiences stereotaxic surgery, Immuno histochemistry, Tunel. His field is in -Cancer Pharmacology -Neuro-Pharmacology -Herbal medicine researches and diabetes