

EFFECT OF UNIQUE EXERCISE SESSION UPON CENTRAL BIOMARKERS LEVELS OF RATS SUBJECTED TO REPEATED MORPHINE EXPOSURE IN EARLY AGE

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Introduction: Preclinical evidence shows that morphine exposure in early life promotes short- and long-term alterations, such as hyperalgesia and changes in neuroimmunomodulatory levels in structures of CNS. And it is known that physical exercise plays a beneficial role in different pain chronic condition. Thus, our objective was to determine the effect of acute aerobic exercise session in adult life upon the central levels of neurotrophins and cytokines in rats exposed to morphine in early age.

Methods: We used neonatal male Wistar rats, divided into 4 groups (n= 5-8/group): Saline; Saline+Exercise; Morphine; Morphine+Exercise. Morphine (5 µg,s.c.) or saline (5µL,s.c.) was administered from P8 to P14 in the mid-scapular region. Unique session of exercise protocol (treadmill, 12 m/min, 20 min) was performed at P30 and P60. And, rats were euthanized in P32 and P62, total cortex and brainstem were collected for Neurotrophic Brain Derived Factor (BDNF), Neural Growth Factor (NGF), Interleukin 6 (IL-6) and IL-10 analyzes using ELISA kit. For statistical analysis, three-way ANOVA (age/morphine/exercise) followed by Bonferroni was used. (Approved by GPPG-HCPA No.140425).

Results: Association of morphine and exercise showed effect upon central BDNF and NGF levels ($F_{(1,47)}=16.012, P<0.001$, and $F_{(1,47)}=7.840, P<0.01$, respectively), presenting decreased levels in the brainstem of rats; on the other hand, both increased levels of IL-6 in cerebral cortex ($F_{(1,47)}=7.840, P<0.01$). We also observed age effect in IL-6 and IL-10 levels in brainstem ($F_{(1,47)}=51.719$ and $F_{(1,47)}=59.322, P<0.001$ respectively).

Conclusion: According to our results, a single session of aerobic exercise associated with exposure to early morphine modulates central levels of neurotrophins and interleukins in a specific-tissue condition. Modulatory effects of exercise can be linked to central neurotrophins levels, however the baseline status of the animal needs to be considered. In addition, an interesting age effect upon central interleukin levels was observed.

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