

عنوان مقاله:

Lateral hypothalamic peptide orexin is involved in morphine dependency in locus coeruleus neurons

محل انتشار:

هشتمین کنگره علوم اعصاب و پایه و بالینی (سال: 1398)

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خلاصه مقاله:

Background and Aim : Opioids are known as one of the most effective analgesic drugs but repeated exposure to them results in dependency. Various brain sites are involved in dependency including locus coeruleus (LC). Orexins are neuropeptides produced in neurons of the lateral hypothalamus, which contribute to morphine-induced dependency, project widely throughout the brain, especially LC. Orexins exert an excitatory effect on LC neurons through OXR1. Withdrawal syndrome is temporally accompanied by LC hyperactivity and blockade of LC neuronal activity attenuates opiate withdrawal symptoms. OXR1 antagonist also attenuate morphine withdrawal signs, thus, orexin peptides may participate in the LC neuronal hyperactivity that is associated with the expression of somatic withdrawal signs. Moreover chronic drugs of abuse influence the orexin system via changes in orexin neural activation and mRNA levels of orexin or its receptors. In this study we compared the expression of OXR1 in the LC of morphine dependent rats and in withdrawal state and also investigated the role of orexin in naloxone induced hyperactivity of LC neurons. **Methods :** Male Wistar rats weighing 250-300 g were used in this study. To incite dependency, morphine was injected (10 mg/kg, i.p.) twice a day for 10 days. In the molecular level we used RT-PCR in order to measure the expression of orexin 1 receptor in LC neurons of healthy and dependent rats and in electrophysiological view the LC neural activity was investigated using in vivo extracellular single unit recording. A selective OXR1 antagonist (SB-334867) was microinjected into the right cerebral ventricle (10 µg/10 µl. i.c.v.) while recording, immediately before naloxone injection. **Results :** In molecular level, RT-PCR showed that chronic administration of morphine caused an increase in expression of OXRs expression in LC and naloxone injection led this expression back to be normal. Morphine injection during 10 days led to the induction of morphine dependency in LC neurons which was observed as a significant increase following naloxone injection and central blockade of ORX1 by administration of ORX1 antagonist (SB-334867) before naloxone injection in morphine-dependent rat undermined increased activity in LC neurons. **Conclusion :** Our molecular and electrophysiological results will evaluate the interactions between orexin receptors and morphine dependency and also indicate that these receptors are involved in hyperactivity of LC neurons induced by naloxone in morphine dependency.

کلمات کلیدی:

Opioids; locus coeruleus (LC); Orexin; RT-PCR; single unit recording

لینک ثابت مقاله در پایگاه سیویلیکا:

