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Chronic morphine treatment alters mRNA expression of CB1 receptor in the rat amygdala

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Background

Repeated administration of μ opioid receptor agonists elicit a progressive enhancement of the behavioural responses. The phenomenon is known as behavioural sensitization. It has been shown that psychostimulants and opioids induce behavioural sensitization. Regulation of CB1 receptor function is important for neural plasticity (such as behavioural sensitization).

Materials and methods

In the present study, rats were treated for 7 days with saline or morphine (10 mg/kg). After 24 h or 7 days wash out period, locomotion, oral stereotypy and state dependent memory in passive avoidance test of animals were measured in the presence or absence of CB1 receptor antagonist (AM251, 5 mg/kg). Meanwhile the mRNA expression of CB1 receptors in some areas of male rat brain (striatum, prefrontal cortex, hippocampus, hypothalamus and amygdala) were measured in chronic morphine treated animals by real time RT-PCR to evaluate the mechanism underly behavioural responses.

Results

The obtained results indicated that chronic morphine treatment followed by 7 days (but not 24 h) wash out period produced behavioural sensitization in animal models of locomotion, oral stereotypy and state dependent memory. Furthermore pretreatment of animals with high dose of AM251 (5 mg/kg), in the test day did not affect the behavioural responses. In the genetic section, real time RT-PCR indicated that chronic morphine treatment followed by 7 days (but not 24 days) wash out period increased the mRNA expression of CB1 receptors in the amygdala (by 55%) of the rat brain. While the expression of CB1 in the other areas of brain were unaffected. Furthermore chronic morphine treatment did not alter the mRNA expression of CB1 receptor in the brain of rat.

Conclusions

These data imply that CB1 receptor is involved in the development (but not expression) phase of the behavioural sensitization

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