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The ventral hippocampus is involved in morphine-induced anxiolytic behavior

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Background

Several studies show that the elevated plus maze (EPM) is one of the models for the selective identification of anxiolytic and anxiogenic drug effects in rodents. Furthermore, morphine and other opiates are known to exert anxiolytic effects probably by interacting many systems one of which could be the serotonergic system. The ventral hippocampus exhibits high densities of μ-opioid receptors and is one of the important brain sites involved in modulation of fear and anxiety.

Materials and methods

In the present study, the effects of bilateral injections of the morphine into the ventral hippocampus (intra-VH) on the EPM test of anxiety were examined in male Wistar rats. In these experiments, animals weighting 220-280 g at the time of surgery were used. Eight animals were used in each group of experiments. Animals were bilaterally cannulated in the VH by stereotaxic instrument, and were allowed to recover 1-week before behavioral testing. All procedures were carried out in accordance with institutional guidelines for animal care and use.

Results

Bilateral intra-VH injections of the different doses of morphine (2.5, 5 and 7.5 μg/rat) increased the percentage of open arm time (%OAT) and open arm entries (%OAE). Thus it appears that morphine produces a significant anxiolytic effect without the significant changes in the locomotor activity. One possible explanation for this effect of morphine could be that it blocks the 5HT release induced by the EPM exposure and so demonstrates an anxiolytic effect.

Conclusions

In conclusion, the VH may be involved in morphine-induced anxiolytic behavior.

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