Abstract

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Effects of acute and chronic treatment with magnesium in the forced swim test in rats.

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BACKGROUND: The antidepressant-like activity of magnesium, the non-specific N-methyl-D-aspartate glutamate receptor antagonist, in the mice forced swim test was demonstrated previously.

OBJECTIVE: In the present study, the effects of this biometal were studied in the rat forced swim test.

METHODS: Magnesium (MgCl2) at doses ranging from 15 to 50 mg Mg/kg reduced the immobility time in the forced swim test, thus exerting antidepressant-like activity. To evaluate tolerance to this effect, we also performed experiments with the following acute/chronic magnesium treatment schedule: chronic saline and saline challenge at 0.5 h before behavioral experiments (S + S), chronic saline and magnesium challenge (S + Mg), chronic magnesium and saline challenge (Mg + S), chronic magnesium and magnesium challenge (Mg + Mg).

RESULTS: The antidepressant-like effect of magnesium was demonstrated in the group treated acutely with magnesium (S + Mg) but not in the chronically treated group (Mg + S) and (Mg + Mg). It is interesting to note that in Mg + Mg group serum concentration of magnesium was quite similar to the S + Mg group (6.44 vs. 6.08 mg/100 ml, respectively), which displayed antidepressant-like effect.

CONCLUSION: The results confirmed that magnesium administered acutely induced the antidepressant-like effects also in rats. However, contrary to mice, chronic treatment with magnesium induced tolerance to this effect in rats.

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