PHARMACOKINETIC INTERACTION AFTER JOINT ADMINISTRATION OF ZINC AND IMIPRAMINE IN FORCED SWIM TEST IN MICE

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Recent preclinical and clinical data indicate beneficial role of zinc in the antidepressant treatment. To evaluate the mechanism of interaction between zinc and antidepressants, in the present study we examined the brain zinc, imipramine and desipramine concentrations in mice treated with combinations of zinc and imipramine and subjected to the forced swim test. We have chosen doses of zinc (10 mg/kg) and imipramine (15 mg/kg) which we have previously found to be ineffective in the forced swim test when given alone. However, when administered jointly, a significant reduction in the immobility time in this test was demonstrated. In the present study, we demonstrated a significant ca. 60% reduction in the brain desipramine and non-significant reduction (ca. 40%) in brain imipramine concentrations in the group of animals treated with zinc plus imipramine compared with animals treated with imipramine alone. The brain zinc concentration in the zinc plus imipramine group was reduced when compared with the group treated with zinc or imipramine alone. Since there was no increase in brain imipramine/desipramine or zinc brain concentration after combined zinc and imipramine treatment, the data suggest that pharmacodynamic rather than pharmacokinetic interaction between zinc and imipramine is responsible for behavioral effect in the forced swim test.

Key words: forced swim test, zinc, imipramine, treatment, determination, brain, mice

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