

Abstract

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Magnesium-deficient diet alters depression- and anxiety-related behavior in mice--influence of desipramine and Hypericum perforatum extract.

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BACKGROUND: A relation between magnesium (Mg) status and mood disorders has been suggested, but evidence remains inconsistent.

METHODS: Therefore, we examined in mice whether Mg-depletion would alter behavior evaluated in established animal models of depression and anxiety and whether these effects would be sensitive to antidepressants.

RESULTS: Compared to control mice fed with normal diet, mice receiving a low Mg diet (10% of daily requirement) for several weeks displayed increased immobility time in the forced swim test, indicating enhanced depression-like behavior. In addition, the partial Mg-depletion increased anxiety-related behavior in the light/dark and open field test, while locomotor activity or motor coordination was not influenced. Chronic oral administration of desipramine (30 mg/kg/day), or Hypericum extract LI160 (Hyp, 380 mg/kg/day) prevented the "pro-depression-like" forced swim behavior in Mg-depleted mice. Furthermore, the increase in anxiety-related behavior of Mg-depleted mice was abolished in both the open field and light dark test by Hyp.

CONCLUSION: Taken together, we report that Mg-depletion leads to enhanced depression- and anxiety-related behavior in mice, which was further validated by the reversibility of the behavioral changes by known antidepressant and anxiolytic substances. Further, the utility of Mg-depletion as a new screening model for clinically active antidepressant and anxiolytic drugs is suggested.

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