

Differential effects of tianeptine on dorsal hippocampal volume in rats subjected to early stress and variable chronic stress during adulthood (#382)

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Neonatal maternal separation induces long-term alterations in the hypothalamic-pituitary-adrenal axis and may increase vulnerability to depression when a stressful situation occurs in adulthood. Some studies, have found significant reductions in hippocampal volumes in patients with major depression. In contrast to other tricyclic antidepressants, tianeptine, a drug that increases serotonin reuptake, produces fewer side effects.

We analyzed, in male rats, whether the interaction between early maternal separation and chronic stress reduces the volume of the dorsal hippocampus or its areas [CA1, CA2/3 and dentate gyrus (DG)], and assessed whether the administration of tianeptine reverses this impairment.

Male Wistar rats were separated from the mother for 4.5 h daily from PN day 1 to 21. From PN day 50, animals were subjected to chronic unpredictable variable stress during 24 days (five types of stressors). During the whole stress protocol, animals were injected with vehicle or Tianeptine (Servier) (10mg/Kg). The Cavalieri method was applied to estimate the volume of the dorsal hippocampus, its areas and strata.

Dorsal hippocampal volume and its areas decreased significantly in separated and stressed animals treated with Tianeptine, respect to separated and non-stressed animals that received the antidepressant. CA1 total area as well as CA2/CA3 and CA1 apical zones showed a significant volume reduction in stressed animals (separated and non-separated) in comparison with non-stressed. The volume of apical zones of rats separated from their mother and treated with tianeptine not differs significantly from the control group (without separation and stress).

These results allow us to establish that tianeptine exerts its actions in a differential manner depending on the type of stressor. Stress in adulthood reduces the apical dendritic arborization of CA1 and CA2/CA3 and this could not be reversed by the antidepressant, while when the damages are caused by early maternal separation, tianeptine return the volume to the controls values.



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