Hyperornithinemia is the biochemical hallmark of hyperornithinemia–hyperammonemia–homocitrullinuria (HHH) syndrome, a genetic disorder characterized by prominent chronic neurological features, including psychomotor and mental retardation, whose pathogenesis is still not understood. In the present study, hyperornithinemia was induced in rat brain during early postnatal development through subcutaneous injection of ornithine (Orn). We then investigated the effect of chronic administration of Orn on physical development and on the performance of adult rats in the open field and in the Morris water maze tasks. Our results show that chronic Orn treatment had no effect on the appearance of coat, eye opening or upper incisor eruption, nor on the free-fall righting reflex and on the adult rat performance in the Morris water maze task, suggesting that physical development and spatial localization were not changed by Orn. However, rats injected with Orn did not habituate to the open field apparatus, indicating a deficit in the habituation to a novel environment. Motor activity was not altered in Orn-injected animals. These data indicate that hyperornithinemia compromises brain functioning, causing impairment of long-standing learning/memory processes, that may be possibly associated to the mental retardation observed in patients with HHH syndrome.

Word keys: Hyperornithinemia–hyperammonemia–homocitrullinuria syndrome, ornithine, open field task.

Supported by: CNPq, FAPERGS, PRONEX and the FINEP research grant Rede IBN-Net and INCT-EN.