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RIBOFLAVIN: BENEFICIAL EFFECTS ON NEUROLOGICAL MOTOR DISABILITY BUT NOT SPATIAL LEARNING AND MEMORY CONSOLIDATION IN MURINE MODEL OF MULTIPLE SCLEROSIS

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This experimental study assessed the effects of riboflavin on motor disability, spatial learning, and memory in experimental autoimmune encephalomyelitis (EAE). The C57BL/6 female mice (n=56) were assigned into 7 groups: sham operated 1 (SO1), healthy mice received PBS (phosphate buffer saline); sham operated 2 (SO2), healthy mice received PBS and riboflavin; sham treatment1 (ST1), EAE mice received water; sham treatment 2 (ST2), EAE mice received sodium acetate buffer; treatment 1 (T1), EAE mice received interferon beta-1a (INF-β1a); treatment 2 (T2), EAE mice received riboflavin; treatment 3 (T3), EAE mice received INFβ-1a and riboflavin. After EAE induction, scoring was performed based on clinical signs. By detecting score 0.5, riboflavin at 10 mg/kg of body weight and/or INFβ-1a at 150 IU/g of body weight, administration were started for two weeks. The brain and spinal cord levels of brain-derived neurotrophic factor (BDNF) were studied using real-time PCR and ELISA methods. Spatial learning and memory were assessed through the Morris water maze (MWM). BDNF mRNA expression and BDNF levels increased significantly in the brain of T3 group compared to the T2 or T1 groups (*P<0.01* and *P<0.05*, respectively). Clinical scores were reduced in riboflavin treated groups compared to others. The EAE mice performed similarly compared to the healthy controlled mice in MWM test. However, T2 and T3 mice swam faster than the ST2 (P<0.05), T1 (*P<0.05*), and ST1 (*P<0.05*) mice. The results concluded that riboflavin has beneficial effects on neurological motor disability mediated by BDNF in EAE model of MS.

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