

Abstract

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The effect of folic acid as an antioxidant on the hypothalamic monoamines in experimentally induced hypothyroid rat.

Ibrahim W, Tousson E, El-Masry T, Arafa N, Akela M.

Department of Medical Biochemistry, Faculty of Medicine, Tanta University, Tanta, Egypt.

BACKGROUND: Thyroid hormones are recognized as key metabolic hormones that play a critical role in the central nervous system development throughout life.

OBJECTIVE: In the present study, we studied the biochemical changes of hypothalamus of hypothyroid rats at post-pubertal stage, and the possible ameliorating effect of folic acid.

METHODS: A total of 50 male albino rats were equally divided into five groups; the first and second groups were the control and folic acid groups, respectively, while the third group was the hypothyroid group in which rats received daily 6-n-propyl-2-thiouracil (PTU) in drinking water for 6 weeks to induce hypothyroidism. The fourth and fifth groups were hypothyroid rats treated with folic acid for 4 weeks during and after receiving PTU, respectively, and were dissected after 6 and 10 weeks, respectively.

RESULTS: There was a significant increase in plasma total homocysteine, malondialdehyde (MDA), oxidized glutathione/reduced glutathione and total nitric oxide and hypothalamic MDA, serotonin and norepinephrine in the hypothyroid rats group as compared to the control group. This reflects hyperhomocysteinaemia and oxidative stress associated with hypothyroid state. On the other hand, hypothalamic total nitric oxide and dopamine in the hypothyroid rats group were significantly decreased when compared to the control group. Treatment of hypothyroid rats with folic acid improves the oxidative stress and hypothalamic monoamines.

CONCLUSIONS: Our results revealed that, folic acid treatment was better if it is administered as an adjuvant after returning to the euthyroid state.

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