

Poster presentation

Propylthiouracil causes behavioral changes in rats: the role of serotonin

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Background

Propylthiouracil is an antithyroid drug that inhibits thyroidal T4 production and peripheral conversion of T4 to T3. The manifestations of hypothyroidism are low metabolic rate, lethargy, bradycardia, sensitivity to cold and mental impairment.

The aim of this study was to determine behavior and endocrine effects after chronic application of propylthiouracil and to measure the serotonin levels in the brain of rats, pre-treated or not with 5-hydroxy-tryptophan.

Materials and methods

Male Wistar Albino rats (140 - 160 g) were allowed free access to drinking water containing 0,02 % Propylthiouracil for 5 weeks. The experimentally PTU- induced hypothyroidism was confirmed by a significant decrease of FT3 and FT4, and increase of TSH plasma levels. We performed Forced swimming test (FST) before and after 5-day-treatment with 5-hydroxy-tryptophan (50 mg/kg/i.p). The serotonin levels in the brain were also measured before and after 5-hydroxy-tryptophan application.

Results

The chronic exposure of Propylthiouracil led to alteration of rat behavior and changes in hypothalamic-pituitary-thyroid axis. A statistically important prolongation of the immobilization time was found in hypothyroid rats compared to controls. We also observed decrease of food intake and body weight. Brain serotonin levels of experimentally induced hypothyroid rats were decreased statistically significant (0,3366 + 0,04829 g/g). Aftermg/g) in

comparison with healthy controls (0,8178 + 0,0536 m 5-hydroxy-tryptophan treatment serotonin levels increased and depressive symptoms in rats diminished.

Conclusions

Our results indicate that PTU-induced hypothyroidism causes behavioral changes and depressive behavior in rats possibly via central serotonergic hypofunction. Depressive symptoms could be avoided via application of serotonergic drugs.