

MORPHOLOGICAL PECULIARITIES OF PINEALOCYTES IN OLD RATS IN CASE OF IMMOBILIZATION STRESS AND ALTERED PHOTOPERIOD

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Abstract:

Introduction. Light plays a very important role in our life. Exposure to sunlight affects the hypothalamus, which is perhaps the most important part of the brain. Light activates the pineal gland and affects the balance of the melatonin and serotonin hormones produced in our body. With decreased light exposure, production of melatonin goes up and causes fatigue; with increased light exposure, production of serotonin increases and elevates your mood and makes you more mentally alert. From the other hand immobilization stress is one of the exogenous reasons, which can cause changes in pineal gland. Aim. To study morphological peculiarities of pinealocytes in old rats in case of immobilization stress and altered photoperiod with help of light and electronical microscoping. Results. The studying of morphological changes in pinealocytes under the influence of altered photoperiod (7-days lightness – hypofunction of pineal gland) showed, that ratio of light and dark pinealocytes was $34 \pm 1,5\%$: $66 \pm 1,6\%$ ($p < 0,001$), that differed from the control group on 30 % ($64 \pm 0,9\%$: $36 \pm 0,8\%$). With help of electronic microscope we found invaginations of nuclear envelope, narrow canals of endoplasmic reticulum and small amount of mitochondriae. Such condition shows the decreasing of pineal gland functional activity. After modulated immobilization stress, the morphological condition of pinealocytes decreased more, than in simple altered photoperiod: ratio of light and dark pinealocytes was $28 \pm 1,3\%$: $72 \pm 1,1\%$ ($p < 0,001$), that differed from control group on 36 %. Pineal ultrastructure showed that nuclear envelope had very deep invagination, cytoplasm was denser with very thin canals of endoplasmic reticulum, mitochondriae were too small and the amount decreased. In such pinealocytes we found a big amount of serotonin granules and this describing showed higher dysfunction of pineal gland in old rats. Conclusion. Thus, dysfunction of pineal gland, caused by immobilization stress on the base of hypofunction studied gland was deeper, than after 7-days lightness.

Keywords: Pineal gland, immobilization stress, photoperiod

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