



клубочків. І хоча відносний обсяг просвіту капсул був трохи більшим, ніж в попередній групі тварин (47,79%), він не досягав значення, характерного для контрольної групи (54,85%).

Відомо, що деяке збільшення відносного обсягу просвіту капсули може побічно вказувати на збільшення клубочкової фільтрації і навпаки. Зниження клубочкової фільтрації розцінюється як гомеостатична реакція, спрямована на зменшення втрати натрію.

Таким чином, вплив екзогенного мелатоніну на діяльність нирок у старих шурів залежить від наявності епіфіза. Мелатонін не усуває змін, що виникали в крові і сечі після епіфізектомії, але нормалізує активність СДГ в шарах нирок, вміст натрію і калію в сосочку. Очевидно, шишкоподібної залози на функціональну діяльність нирок залежить не тільки від мелатоніну, але й від усього комплексу вироблених в ньому біологічно активних речовин.

Bulyk R.Y., Vlasova K.V.

EXOGENOUS MELATONIN INFLUENCE ON CYTOMETRIC INDICES OF THE SUPRAOPTICAL NUCLEI IN THE STRESSED RATS' HYPOTHALAMUS UNDER CONDITION OF 24 HOUR ILLUMINATION

*Department of medical biology and genetics
Higher State Educational Institution of Ukraine
«Bukovinian State Medical University»*

The hypothalamus is the highest coordinating center of the neuroendocrine system, whose nerve cells are combined in multiple nuclei with various links between themselves and the structures of the CNS, and also possessing secretory activity (these are mainly front and medial areas), carrying out regulatory functions necessary to maintain homeostasis. However, the issues, concerning the correction of the influence of stressors on supraoptical nuclei (SON) in the hypothalamus in case of a changed photoperiod have not been sufficiently studied.

Our study objective was to find out exogenous melatonin influence on changes in cytometric indices of hypothalamus SON under 24 hour illumination.

Experimental animals (mature nonlinear male white rats) were divided into four groups and in each of them biomaterial sampling was performed at 2 PM and 2 AM on the eighth day of the experiment. Fixed with neutrally buffered 10% formalin solution and later coloured with hematoxylin and eosin, microscopic sections 5mm thick were studied in the programming environment of GIMP 2.8. The terms of the experiment were conditioned by different functional activity of the pineal gland and by the production of a leading chronobiotic – melatonin (MT) in the indicated time periods. The animal groups which underwent 24 hour illumination were injected with exogenous MT for correction. The intact animals underwent a standard photoperiod (12.00L:12.00D).

In the group of animals which were administered exogenous MT and exposed to light stress (+24.00L: 00D) a reduction in such indices as the volume of the neurocyte nucleus (at 02.00 AM - $198 \pm 1,3$; 02.00 PM - $197 \pm 1,2$), neurocyte volume (at 02.00 AM- $1114 \pm 10,8$; 02.00 PM - $1099 \pm 10,4$), a standard deviation of the neurocyte nucleus coloring (at 02.00 AM - $9,1 \pm 0,18$; 02.00 PM - $8,8 \pm 0,14$), increasing in the nuclear-cytoplasmic ratio (at 02.00 AM - $0,178 \pm 0,0024$; 02.00 PM - $0,179 \pm 0,0023$) and of the optical density of staining nuclei neurocyte nucleus staining (at 02.00 h - $0,289 \pm 0,0028$, 14.00 h - $0,296 \pm 0,0027$) compared to intact group.

These cytometric parameters are much higher than those in the groups, which were not injected with MT, but they still do not reach the indices of intact animals.

Bulyk R.E., Vlasova K.V., Lomakina Yu.V., Khomenko V.G.

DEPENDENCE OF MELATONIN RECEPTORS DENSITY IN THE NEUROCYTES OF HYPOTHALAMUS SUPRAOPTICAL NUCLEI ON STRESS FACTORS IN DIFFERENT PERIODS OF THE DAY

*Department of medical biology and genetics
Higher State Educational Institution of Ukraine
«Bukovinian State Medical University»*

Disturbances in circadian rhythmicity due to the living conditions (working at night, jet lags) or involuntary circumstances (illness, aging) cause numerous mental and physical disorders. Keeping to physiologically characteristic lifestyle is especially important for human safety and productivity. Night secretion of the pineal gland hormone melatonin is a signal to any structures that have melatonin receptors in the brain and peripheral organs, and it affects the time organization of a large number of functions.

The aim of the study was to determine the influence of stress on the optical density of melatonin receptor 1A (M1A) in neurocytes supraoptic nuclei (SON) of the hypothalamus.

Sexually mature males of nonlinear albino rats were divided into three series, and biomaterial sampling was carried out at 2 PM and 2 AM in each of them on the eighth day of the experiment. The material was fixed with neutral buffered 10% formalin solution for 22 hours, and after rapid dehydration it was embedded in paraffin at 58°C. To determine the optical density of melatonin receptors 1A, specific polyclonal antibodies produced by Abcam (UK) and streptavidinbiotin visualization system LSAB2 (USA).

The indices of optical density of specific M1A neurocytes of SON staining obtained in the intact group (at 02.00 AM- $0,488 \pm 0,0024$, at 02.00 P.M. - $0,464 \pm 0,0023$, $p = 0,002$) and in animals subjected to immobilization (at 02.00 AM- $0,295 \pm 0,0019$, at 02.00 P.M.- $0,286 \pm 0,0018$, $p = 0,012$) had a probable value and were characterized by a clear diurnal periodicity. In the group of animals with pineal gland hypofunction modulation (at 02.00 A.M.- $0,216 \pm$