



Vlasova K.V.

REGULARITIES OF CHANGES OF NEURON MORPHOFUNCTIONAL CONDITION OF THE HYPOTHALAMIC SUPRAOPTIC NUCLEI IN CASE OF VARIOUS DURATION OF PHOTOPERIOD

*Department of Medical Biology and Genetics
Bukovinian State Medical University*

Different systems of the body follow circadian rhythms that are synchronized with a master clock in the brain. This master clock is directly influenced by environmental cues, especially light, which is why circadian rhythms are tied to the cycle of day and night. Lifestyle is a major determinant of circadian health and relates to people's psychosomatic factors such as feeding-fasting, activity-rest, sleep-wake routines. Technology growth provided a platform to lifestyle modifications leading to conditions like mental depression, cancers, cardiovascular disease, diabetes, and many other diseases.

Objective – to find regularities of changes of neuron morphofunctional condition of the hypothalamic supraoptic nuclei in case of various duration of photoperiod, as well as to detect the role of melatonin in the mechanisms of correction of the detected deviations; methods – morphometric, densitometric, histological, immunohistochemical, electron microscopic, physiological, correlation and regressive analysis, mathematic statistics.

More pronounced circadian regularities of the morphofunctional parameter rebuilding of the examined hypothalamic neuroendocrine cells under continuous lighting than in case of light deprivation are found; for the first time on the basis of the conducted ultrastructural examinations of rats under conditions of light stimulation more pronounced destructive disorders in the hypothalamic neurons are found, as well as reduction of their functional activity in the examined periods of the day than in case of light deprivation; on the basis of a comprehensive examination of the character of melatonin receptors density in hypothalamic supraoptic neurons during 24 hours convincing evidence of photo-induced circadian rhythm disorders of melatonin receptors functioning in the examined neuroendocrine cells is received; as a result of the conducted study, for the first time circadian variations of optic density and standard deviation of nuclear staining, nuclear-cytoplasmatic coefficient of pineal gland cells of rats kept under conditions of changed photoperiod are demonstrated; the regularity is proved, according to which introduction of exogenous melatonin (0,5 mg/kg) promotes the increase of ultra-structures resistance to light stimulation, the tendency to normalize cytometric parameters of hypothalamic supraoptic neuron components of rats.

Thus, more pronounced circadian regularities of the morphofunctional parameter rebuilding of the examined hypothalamic neuroendocrine cells under continuous lighting than in case of light deprivation are found; for the first time on the basis of the conducted ultrastructural examinations of rats under conditions of light stimulation more pronounced destructive changes in the hypothalamic neurons are found, as well as reduction of their functional activity in the examined periods of the day than in case of light deprivation.

Yosypenko V.R.

CORRECTION OF IMMUNOHISTOCHEMICAL DISORDERS OF THE LATERAL PREOPTIC NUCLEUS OF THE HYPOTHALAMUS OF MATURE RATES CAUSED BY CONSTANT LIGHTING

*Department of Medical Biology and Genetics
Bukovinian State Medical University*

Physiological processes in living systems are subordinate regular cyclic oscillations - biological rhythms. Humans have a 24-hour circadian sleep-wake cycle, but sleep is more than just part of the circadian system. About a third of a person's life is spent asleep, and its quality determines overall health. An important component in the regulation of the sleep-wake cycle is the lateral preoptic nucleus of the hypothalamus. Another important structure involved in the regulation of the sleep-wake cycle is the pineal gland, which synthesizes the hormone melatonin. The secretion