background. As a result, those who suffer from chronic sleep loss and/or stress are more vulnerable to infectious infections.

The production of melatonin is significantly impaired in people with chronic insomnia. The longer a person has experienced symptoms of insomnia, the greater the effect on melatonin concentration. However, in the case of chronic stress, initially, the concentration of melatonin rises significantly as a protective mechanism exerting anti-inflammatory and antioxidant effects, dropping sharply after. So, restoring (even partially) normal sleep habits and reducing anxiety through melatonin may have a significant public health effect during current COVID-19 crisis.

Thus, we may be able to prevent the development of severe disease symptoms in coronavirus patients, reduce the severity of their symptoms, and/or reduce the immuno-pathology of coronavirus infection on patients' health after the active phase of the infection is over by using the safe over-the-counter drug melatonin.

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SUPRAOPTIC NUCLEI RECEPTORS DENSENESS AT NIGHT PERIOD UNDER LIGHT EXPOSURE

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Melatoninis a hormone that your brain produces in response to darkness. It helps with the timing of your circadian rhythms (24-hour internal clock) and with sleep. Being exposed to light at night can block melatonin production and it affects the time organization of a large number of central and peripheral functions. It is also a powerful antioxidant mediator and has roles in other physiologic pathways. Melatonin deficiency is associated with metabolic derangements including glucose and cholesterol dysregulation, hypertension, disordered sleep and even cancer.

Our aim was to check the reaction on light stress of melatonin receptors 1A type in magnocellular neurons of supraoptic nuclei (SON) of the hypothalamus. Objective – to detect the role of light on melatonin receptors of supraoptic nuclei. White male rats were divided into two groups with the same biomaterial sampling time at 2 o'clock of midnight on the eighth day. The difference between groups is the light exposure on laboratory animals. The brain samples were fixed with formalin, dehydrated and it was embedded in paraffin. To detect melatonin receptors denseness was used specific polyclonal antibodies produced by Abcam.

Staining of SON neurocytes obtained denseness of melatonin receptors at 02.00 A.M. – 0,488± 0,0024 under complete darkness whereas in the group of animals with light exposure influence at 02.00 A.M. the results of denseness of receptors – 0,216 ± 0,0017 in SON indicating the existing primary signs of cellular disfunctions.

Saving the biorhythm is extremely important as changing the functioning of the hypothalamus SON neurocytes is likely to have significant consequences associated with an imbalance of homeostasis. Hence all of the above mentioned and further more menaces were an absolute outcome of a prolonged and intense disturbance in the daily routine and habits which must be subjected in order to do the needful.

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SUBMICROSCOPIC CHANGES OF THE LATERAL PREOPTIC NUCLEUS OF THE HYPOTHALAMUS UNDER LIGHT STIMULATION

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Today, there is an increase in the number of elderly people among the world's population. Typical problems of this age group are impaired quality and/or duration of sleep, which can affect the development of pathological processes and overall health. Sleep is an extremely complex genetically determined cyclic process that is regulated by homeostatic and circadian components involving various neural structures, among which the lateral preoptic nucleus (LPO) of the hypothalamus plays a key role.

The aim of the study was to investigate the effect of light stimulation on the ultrastructural characteristics of LPO neurons in the hypothalamus of old rats.

The experiments were performed on 24 old white male rats. The test material was fixed in a 2.5% solution of glutaraldehyde prepared on the basis of phosphate buffer with a pH of 7.2–7.4. Next, post-fixation was performed in a 1% solution of osmium tetraoxide and dehydrated in propylene oxide, after which it was poured into a mixture of epoxy resins. Ultrathin sections made on an ultramicrotome LKB-3 were contrasted with uranium acetate and lead citrate according to the Reynolds method and studied under an electron microscope PEM - 125K.

Electron microscopic examinations of LPO of the hypothalamus under standard light regime at 2 pm found cell nuclei of round or elliptical shape with clear contours of the nuclear membrane, which can form shallow intussusception, the perinuclear space is not expanded. The cytoplasm of neurons contains moderately developed tubules of the granular endoplasmic reticulum (EPR) and cisterns of the Golgi complex (GC). There are mitochondria with clearly contoured cristae and a moderately osmophilic matrix.

At the same time, the neurons of the LPO of the hypothalamus under the conditions of the standard mode of illumination at 2 am contain nuclei with uneven contours, sometimes with rather deep indentations. The neuroplasm contains well-developed tubules of granular EPR with ribosomes fixed on their membranes. GC cisterns are small and localized paranuclear, but many vesicles and microbubbles are found. Mitochondria rounded, small, with moderately pronounced cristae.

A study of the ultrastructure of LPO of the hypothalamus at 2 pm under light stimulation showed the presence of "dark" neurons. The detected cells contain osmophilic karyo- and neuroplasm. The nuclei of the cells are pyknotic, electron-dense, and contain a nuclear membrane intussusception. The cytoplasm of cells is compacted, it is poorly defined organelles that are destructively altered. In the cytoplasm of cells, dilated tubules of granular EPR and CG cisterns are visualized, with the formation of vacuole-like structures. Mitochondria are also destructively altered, vacuolated with partially reduced cristae.

A study of the ultrastructure of LPO of the hypothalamus under light stimulation at 2 am showed that the neurons contain a rounded nucleus with electron-dense karyoplasm and uneven contours of the nuclear membrane, which forms deep intussusception. The hyaloplasm is also compacted, the EPR tubules are determined, which are locally expanded with the formation of vacuole-like structures. Mitochondria are small in size, vacuolated, with an enlightened matrix and reduced cristae.

Thus, we can conclude that the neurons of the LPO of the hypothalamus of old rats show increased functional activity in the dark. Light stimulation leads to hypertrophic and initial destructive changes in the nuclei and organelles of the neurons of the LPO of the hypothalamus.

Волошин В Л.

ХАРЧОВІ ДОБАВКИ - КОРИСТЬ ЧИ ЗАГРОЗА ДЛЯ ЗДОРОВ’Я ЛЮДИНИ

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Життя і здоров’я людини нерозривно пов’язане із вживанням їжі. Харчування це найважливіша фізіологічна потреба, вживаючи їжу вона не тільки задовольняє свої гастрономічні вподобання а й поповнює організм необхідними для його нормальної роботи речовинами (білками, жирами, вуглеводами та ін.). Фізичний стан організму і його функціональність залежить від якості та складу спожитого. Іще з давніх часів людина шукала способи, як подовжити термін зберігання продуктів харчування так щоб вони не втратили свої властивості. За останні десятиліття у цьому напрямку людство досягло значних результатів, власне для подовження термінів зберігання харчових продуктів та збереження і покращення їх властивостей людина стала використовувати різні харчові добавки.

Харчові добавки це природні або штучно створені речовини, що додаються до продуктів харчування для надання кінцевому продукту бажаних якостей. Залежно від мети та