

THE AUTONOMIC NERVOUS SYSTEM IN THE CORRECTION OF FUNCTIONAL DISORDERS OF THE SMALL INTESTINE IN THE COMPLEX TREATMENT OF EXPERIMENTAL ETHANOL INTOXICATION

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АВТОНОМНАЯ НЕРВНАЯ СИСТЕМА В КОРРЕКЦИИ ФУНКЦИОНАЛЬНЫХ РАССТРОЙСТВ МАЛОГО КИШЕЧНИКА В КОМПЛЕКСНОМ ЛЕЧЕНИИ ЭКСПЕРИМЕНТАЛЬНОЙ ЭТАНОЛЬНОЙ ИНТОКСИКАЦИИ

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The work is devoted to fundamental medical and biological studies, which make it possible to understand the basic laws of photobiology, part of which is super venous laser irradiation of blood. Neurohistochemical, histochemical, and electrophysiological methods were studied in the Wistar rats morphofunctional state of the small intestine under the influence of the supravenuous laser blood irradiation in the complex treatment of experimental ethanol intoxication.

The importance of the autonomic nervous system in the understanding of the characteristics of the effect of superluminal laser irradiation of blood on biological tissues in the complex treatment of experimental ethanol intoxication is emphasized. Experimental pathogenetically justified use of laser stimulation initiates the activation of adaptive processes, which is reflected in the restoration of the motor function of the small intestine on the 3rd day after the treatment of ethanol intoxication. The changes observed by us under the influence of supravenuous laser irradiation of blood can be estimated as a state of increased activation of autonomous regulatory systems of the small intestine. Normalization after the use of supravenuous laser irradiation of blood imbalance of neuromediation in the tissues of the small intestine, the increased activity of the enzymes of the aerobic cycle in the muscular layer of the named intestine is a consequence of adaptive changes, which is reflected in the restoration of the motor function of the small intestine with ethanol intoxication.

Keywords: treatment of experimental ethanol intoxication; enzymes of tissue respiration; neuromediation; motor function of the small intestine; adaptation processes.

Работа посвящена фундаментальным медико-биологическим исследованиям, позволяющим понять основные закономерности фотобиологии, составной частью которой является надвенозное лазерное облучение крови. На крысах линии Вистар нейрогистохимическими, гистохимическими, электрофизиологическими методами исследованиями изучалось морфофункциональное состояние тонкой кишки под влиянием надвенозного лазерного облучения крови в комплексном лечении экспериментальной этаноловой интоксикации. Подчеркнуто значение вегетативной нервной системы в понимании особенностей воздействия надвенозного лазерного облучения крови на биологические ткани в комплексном лечении экспериментальной этаноловой интоксикации. Экспериментальное патогенетически обоснованное применение лазерной стимуляции инициирует активацию адаптационных процессов, что выражается в восстановлении моторной функции тонкой кишки на 3 сутки после лечения этаноловой интоксикации. Наблюдаемые нами под влиянием надвенозного лазерного облучения крови изменения, можно оценить как состояние повышенной активации автономных регуляторных систем тонкой кишки. Нормализация после применения надвенозного лазерного облучения крови дисбаланса нейромедиации в тканях тонкой кишки, повышение активности ферментов аэробного цикла в мышечной оболочке названного отдела кишечника является следствием адаптивных изменений, что выражается в восстановлении двигательной функции тонкой кишки при этаноловой интоксикации.

Ключевые слова: лечение экспериментальной этаноловой интоксикации; ферменты тканевого дыхания; нейромедиация; моторная функция тонкой кишки; адаптационные процессы.

Introduction. The urgency of the problem lies in the prevalence of ethanol intoxication (EI), which determines its medical and social significance as the most important factor in high disability and mortality in the world [1, 6, 7]. The aim of the work was to identify the peculiarities of the neurotransmitter status of the small intestine under the influence of the supravenuous

laser blood irradiation in the complex treatment of EI.

Material and methods. The EI model in Wistar rats (90) was created by the method of Shelygina K.V. and others [2]. Intragastric injection of 40% of the ethanol solution at the rate of 4 g/kg/day mass for 5 days was loaded daily. Immediately after setting up the EI model and for 5 days, animals of the II series of experiments were adequately compensated for exchange, water-electrolyte, hemodynamic disorders, including sufficient infusion-detoxification therapy (water-electrolyte solutions, hemodesis at the rate of 7 g/kg intravenously during the day through the tail vein).

In order to activate bioenergy in the complex treatment, EI conducted a course of NLOCs using an LG-79-1 helium-neon laser with a wavelength of 633 nm with a light output of 2 mW and an exposure time of 20 min to the projection area of the femoral vein and external jugular vein. A comprehensive research program included the identification of adrenergic fibers by incubation with glyoxylic acid [5], and cholinergic fibers by the Karnovsky-Roots method. The density of adrenal and cholinergic plexuses was determined by the method of Stropus, RA [4]. The activity of catecholamines in adrenergic and acetylcholinesterase (AChE) in the cholinergic nerve plexus of the small intestine was assessed by the cytofluorimetric method on a LYUMAM I-2 microscope with a photometric attachment of PMEL-1A.

To study the motility of the small intestine electrophysiological method of computer peripheral electroenterography was used [3]. From the recorded biopotentials, the following parameters of the harmonic component were taken as the criteria under study: the value of the electric potential VEP (mKV), the number of maxima of the CM (max/min), the degree of arrhythmia SA (used units). The histoenzymatic profile of the small intestine was assessed using a complex of histochemical research methods. The quantitative and qualitative characteristics of the activity of redox enzymes of aerobic and anaerobic respiration in the muscular elements of the small intestine of animals were studied: GL-6-FDG, NAD by R. Lilly, LDH by Rubinstein L.

All the obtained digital material was subjected to static processing by the method of variation statistics, using the Statgraph statistical software package, recorded on a computer like IBM PC 180386/40.

Results and discussion. It has been proven that in the mechanism of development of intestinal

enteropathy in experimental EI, one of the leading factors is dysfunction of the autonomic nervous system.

Analysis of the research results showed that the use of supravenuous laser irradiation of blood in the complex treatment of EI contributes to the earlier manifestation of compensatory-adaptive processes in the adrenal and cholinergic nervous structures of the intermuscular nerve plexus of the small intestine. It can be assumed that supravenuous laser irradiation of blood, reducing the level of EI in animals in the complex treatment of this pathology, leads to an improvement in intramural hemodynamics in the small intestine wall, thereby normalizing the functional imbalance of neuromediation in the named intestinal section, which leads to an improvement in its motor activity.

The use of supravenuous laser irradiation of blood in animals in the complex treatment of EI leads to the activation of intracellular redox processes in the tissue of the small intestine, which is an indicator of the "energy well-being" of this organ. Such an increase in the activity of the enzymes of the aerobic cycle in the muscular layer of the small intestine of animals can probably indicate an additional inclusion in the processes of compensation and adaptation of the energy exchange of the mechanism of tissue oxidation under the influence of supravenuous laser irradiation of blood.

Summarizing the results of the study, it is important to emphasize that the use of supravenuous laser irradiation of blood in the complex treatment of EI has a more pronounced effect on reactive changes in the nervous tissue of the muscular membrane of the small intestine, probably mediated through neuro-diatory cholinergic mechanisms. It is important to note that the parasympathetic nervous system in the evolution of mammals and humans is more ancient than the sympathetic nervous system; therefore, it can be assumed that the compensatory mechanisms of activation of this system are more perfect.

This allows us to conclude that the use of supravenuous laser irradiation of blood has an important general biological significance in the complex treatment of EI, realizing the inclusion of compensatory-adaptive processes and activating sanogenetic mechanisms in the body under the influence of laser radiation.

Some of the innovative solutions presented in the work are currently at the approbation stage and require further study both experimentally and clinically.

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