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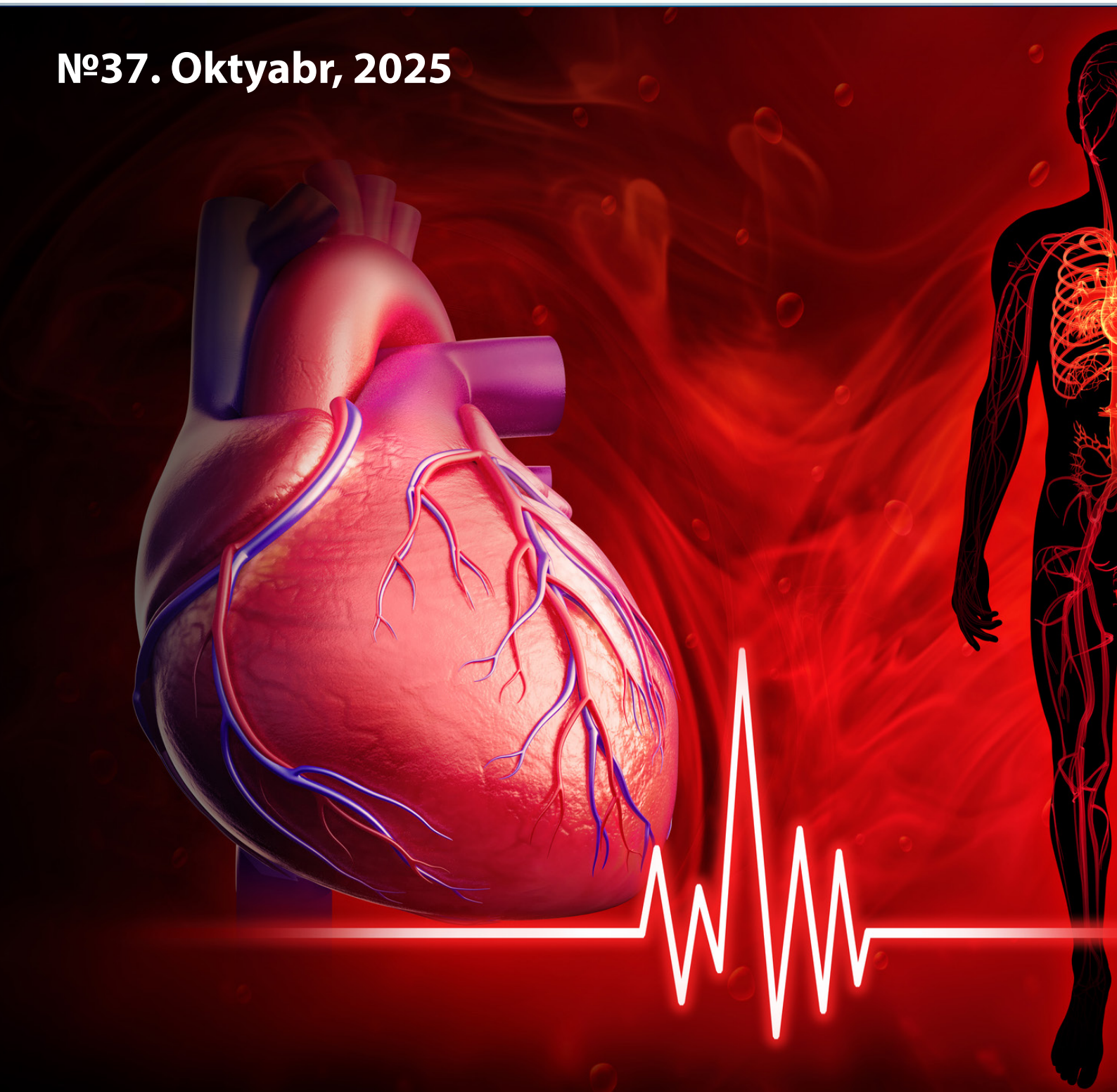

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[1] Мақола чоп этилган пайтда халқаро миқёсда фаолият кўрсатадиган қуйидаги йирик нашриётлар ёки маълумотлар базаси асосида «импакт-фактор»га эга бўлган илмий журналларда нашр этилган мақолалар мазкур Рўйхат таркибига киритилган илмий журналларда чоп этилган илмий мақолалар сифатида қабул қилинади: (1) Web of Science (Web of Knowledge), (2) Journal Impact Factor, (3) Scopus, (4) Journal Citation Reports, (5) Global Impact Factor, (6) International Impact Factor Services, (7) Agris, (8) Chemical Abstracts CAS, (9) GeoRef, (10) PubMed, (11) Springer, (12) Index Copernicus, (13) Bielefeld Academic Search Engine, (14) ResearchBib, (15) Directory of Research Journals Indexing, (16) Directory Indexing of International Research Journals-CiteFactor, (17) Open Academic Journals Index, (18) Ulrich's Periodicals Directory, (19) Scientific Indexing Services, (20) General Impact Factor, (21) InfoBase Index, (22) International Society for Research Activity, (23) Scientific Journal Impact Factor, (24) Scientific Research Publishing Inc, (25) Directory of Open Access Journals, (26) Academic Journals Database, (27) Academic One File, (28) Advanced Science Index, (29) Anthropological Index Online, (30) Anthropological Literature, (31) Anthropology Plus, (32) Asian Education Index, (33) Bibliography of Asian Studies, (34) Compendex, (35) CrossRef, (36) HINARI, (37) Hindawi, (38) Libraries Resource Directory, (39) Impact Factor Search, (40) ResearchGate, (41) SCImago, (42) Scisearch, (43. з/х) Universal Impact Factor.

Шунингдек, жаҳоннинг икки юзта энг яхши олий таълим муассасаси рўйхатидаги олий таълим муассасалари томонидан чоп этилган илмий ишлар ва мақолалар тўпламида нашр этилган илмий мақола (материал)лар мазкур рўйхатга киритилган илмий нашрларда чоп этилган мақолалар сифатида қабул қилинади.

INFLUENCE OF KOBAVIT ON THE ACTIVITY OF THE MONOOXYGENASE SYSTEM IN WOMEN WITH UTERINE FIBROIDS

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Key words: Uterine fibroids, Synthetic progestins, MOS, Pharmacokinetics of Antipyrine, Kobavit, Hepatoprotector

Abstract: Taking into account the insufficient effectiveness of conservative therapy for uterine fibroids, non-surgical treatment of uterine fibroids was attempted with the use of Kobavit. At the same time, special attention was paid to the detoxifying potency of the liver - MOS. The study was conducted in 33 patients with a verified diagnosis of uterine fibroids, who were divided into 2 groups, one of which received Narcolut, the other Narcolut with Kobavit. The detoxifying potency of the liver was judged by the pharmacokinetic parameters of antipyrine. The results of the study showed that there is a significant inhibition of the function of MOS activity in patients with uterine fibroids. Narkolut does not lead to the complete elimination of violations of the MOS. In order to increase the effectiveness of conservative treatment of uterine fibroids, it is advisable to combine the use of synthetic progestins with cobavit.

Introduction.

The development of effective methods for the treatment of benign hyperplastic diseases of the organs of the reproductive system is extremely relevant, because despite the increase in the arsenal of hormonal drugs used in gynecological practice, as well as the expansion of possibilities for the use of non-drug methods, treatment results are not always quite effective (1,2,3). This is probably due to the complex mechanisms of the pathogenesis of the development of pathological conditions of the organs of the reproductive system against the background of multisystem damage to the body of women.

In the conservative treatment of patients with uterine fibroids, a significant role is played by synthetic progestins, since the point of view about estrogen stimulation of tumor growth is well known (5,6) However, their use is accompanied by a noticeable inhibition of the absorption-excretory, protein and fat-lipid functions of the liver (6,7). Based on this, on the days of taking non-steroidal series of drugs, in order to prevent

possible side effects of medications, it is recommended to prescribe protectors of the gastrointestinal-hepatic complex (6,7). The above served as the basis for conducting this study, the purpose of which was to study the effect of the combined use of kobavit on the monooxygenase system (MOS) of the liver - the main system providing the metabolic functions of the organ in women with uterine fibroids. Kobavit, as is known, is a domestic hepatoprotector (9), chemically it is a complex compound of trivalent cobalt with vitamin U and glutamic acid (9). It has the properties of improving lymphopoiesis, immunity in anemia of 1st and 2nd degrees (10).

The main part.

Under observation were 33 sick women aged from 35 to 57 years (with an average age of 43.8+-0.6 years. The duration of the disease from first diagnosis ranged from a few months to six years) with a verified diagnosis of uterine fibroids. In five patients, myoma size did not exceed 6-8 weeks of pregnancy, while in three patients, it was found at 10-11 weeks (9.1%). Most of the patients examined had a body weight slightly above the physiological norm (first-degree obesity).

The menstrual cycle had an average of 28-30 days, and menstruation lasted for five or more days, often accompanied by heavy bleeding. Reproductive activity was preserved in all cases, but infertility was found in the anamnesis of three women: primary infertility in two (three years and five years) and secondary infertility in one woman (more than six years). Out of all those examined, only two women had 2-3 pregnancies, while 13 women had 4-5 pregnancies. Multiple births (three or more births) were reported by 18 women (54.55%). Of these women, 81% had 1st grade of anemia, 46.2% had respiratory system pathologies, 54% had gastrointestinal system diseases, and 30.8% suffered from diseases of the hepatobiliary system.

The functional activity of MOS was assessed based on the antipyrine test, which was performed twice: at the first visit of patients after diagnosis and after conservative treatment.

The patients were divided into two groups according to the principle of random selection. Both groups were comparable in age, diagnosis, concomitant extragenital diseases, and race. In patients of the first group, treatment was carried by Narkolut 0.5g one time a day during 20 days. Second group along with this additionally received kobavit 0.01g 2 times a day during 20 days. The study of pharmacokinetic parameters (PK) of antipyrine was always carried out in the morning, after administration of antipyrine orally at a dose of 10 mg/kg (1% solution of the drug at the rate of 1 ml per 1 kg of body weight).In the blood serum taken after 3, 12 and 24 hours, the content of antipyrine was determined by using the spectrophotometric method. The values of T1/2, aVd, MCP, AUS were calculated using previous methods (13). The results obtained were compared with the data of a group consisting of 6 practically healthy women of

the appropriate age who were familiarized with the purpose of follow-up. The figures data were processed by the method of variation statistics.

Table 1

The influence of complex treatment with the inclusion of cobavit on the pharmacokinetic parameters of antipyrine in patients with uterine fibroids

Groups	$T_{½}$, h	aVd ml/kg	MCR ml/kg.h	k_{el} h^{-1}	AUS,mkg/min. ml
Healthy	9,0 ±0,86	536,9±75,8	40,8±2,59	0,08066±0,00772	250,8±17,7
Uterine fibroids: on admission	18,7±1,0*	592,9±25,3	23,2±1,19*	0,04038±0,00222*	473,1±35,6*
after treatment	16,0±0,93* 12,0±0,92*#	490,7±38,8# 584,1±57,7	22,0±2,01* 36,8±4,79#	0,04540±0,00346* 0,05833±0,00457*#	491,9±43,9* 319,0±33,0#

Note: * - statistically significant differences compared to healthy individuals.

--compared to data upon admission to the clinic.

in the numerator – the results obtained in patients treated with synthetic progestins.

in the denominator – data from patients additionally receiving cobavit.

The data obtained showed that uterine fibroids are accompanied by viral significant violations of antipyrine *PK* parameters. Thus, compared with healthy individuals, the value of the half-life of distribution (T1/2) is extended by 107.8%, the area under the pharmacokinetic curve (S) - by 89%. At the same time, the value of metabolic clearance (*MCR*) and elimination constant (*Kel*) were measured to be 43.2 and 50%, respectively. Against this background, the value of the current volume of distribution (*aVd*) does not undergostatistically significant changes (see table 1). The revealed violations of the *PK* of antipyrine clearly indicate inhibition of the functional state of the MOS in patients with uterine fibroids. Since antipyrine is quickly and completely absorbed from the digestive system, it is distributed evenly throughout the entire liquid environment of the body, slightly binds to tissue and plasma proteins and is completely metabolized with the participation of cytochrome P-450 123 isoforms (14,15). Therefore, the test with antipyrine has found wide use in clinical practice as the most reliable, simple and informative test in assessing the functional activity of the MOS. With low MOS activity, the oxidation of endogenous compounds, including hormones, slows down, and their concentrations in body fluids, and especially in the blood, increase, which causes an increase in their biological effect on target organs. Considering this circumstance,

it can be assumed that hyperestrogenemia observed in women with uterine masses may be the result of a decrease in biotransformation and a slowdown in the elimination of estrogens, under conditions of which their stimulating effect on the process of endo- and myometrial hyperplasia increases. Probably, from these considerations it is clear that the development of the uterine fibroids is often accompanied by a variety of metabolic disorders (6). Therefore, in managing patients with benign hyperplastic diseases of the uterus, special attention should be paid to the correction of concomitant metabolic problems due to extraginal pathology. This is an effective measure to prevent the development of neoplastic processes in the target organs of the reproductive system (3,4). As shown by the analysis of the variation series of the obtained results, the *PK* parameters of antipyrine in a number of patients were significantly violated, and were almost twice as high as the average value of group. These are patients who, in addition to uterine fibroids, were diagnosed with liver and lung pathologies on the background of varying degrees of anemia. It is believed that after hormonal therapy the state of the hepatobiliary system improves, however, a number of its functions remain impared. Therefore, along with hormonal therapy, women with benign hyperplastic processes of the uterus must be prescribed hepatoprotective agents. uterus, it is not necessary to prescribe hepatoprotective agents (7). Moreover,for the purpose of warning norsteroid series possible side effects of using drugs and it is recommended to prescribe gastric protectors gastro-intestinal complex (6). Considering the above, it was of great interest in using cobavit against the background of hormonal therapy for uterine fibroids, the effectiveness of treatment, as well as on the functional state of the MOS system.

The results of the study showed that after hormone therapy antipyrine PK indicators only tended to recover, since there were clear impairments compared to the level of healthy individuals. Thus, the values of T1/2 and S were increased by 77.5 and 96.1%, and the decrease in the MCR value was by 46.1 and 43.7%. It can be seen that there were no statistically significant changes after hormone therapy in patients compared to the initial values. Moreover, some parameters (MCR, S) even worsened. Consequently, hormonal therapy does not have a restorative effect on the functional activity of the MOS. This conclusion is in accordance with the data of other researchers who have established the negative effect of hormone therapy on the metabolic functions of the liver in uterine fibroids (4,7). A different picture of changes in antipyrine PK disturbances was observed in patients receiving additionally Kobavit. Thus, the values of T1/2 and S decreased by 25 and 35.1%, and the values of MCR and Kel, on the contrary, increased by 67.3 and 28.5%, respectively, compared to the control group of patients not taking this hepatoprotector. As can be seen from the data given in table 1 in treated women with Kobavit clearly restored a number of parameters of the pharmacokinetics of antipyrine. Consequently, the use of cobavit together with synthetic progestins in patients with uterine fibroids allows the restoration of the functional activity of the liver MOS, which plays an important role in the processes of biological transformation and con-

jugation of xenobiotics and endogenous physiologically active substances, including sex hormones. This conclusion is in good agreement with the data of researchers who have established the stimulating effect of cobavit on a number of metabolic processes occurring in the liver, such as bile formation (8), metabolism of carbohydrates (11) and lipids (10). Moreover, in case of liver pathologies, this cobalt coordination compound was not inferior in its effectiveness to the well-known hepatoprotectors Essentiale and Silbor. Probably, when using cobavit, the elimination of violations of these types of metabolism is the result of the restoration of the functional activity of the MOS because it plays a central role in these processes. Analysis of the results of a study of the pharmacokinetics of antipyrine revealed that the positive effect of cobavit on the functional activity of MOS was more pronounced in women taking this drug against the background of megistron than in narcolut. At the same time, in the group of patients treated only with synthetic progestins, the degree of disturbances in the pharmacokinetics of antipyrine remained to a higher degree, especially in women receiving narcolut. The latter, although in the majority of patients normalized the clinical manifestations of fibroids (menstrual cycle, volume of blood loss, painful sensations during menstruation, etc.), however, had a negative effect on the liver. This is probably due to the fact that the drug has an inhibitory effect on synthetic processes not only in the ovaries, but also in other organs, including the liver. Therefore, when using narcolut, careful monitoring of the condition of the liver is recommended (7,6). Consequently, the functional activity of MOS, judging by the antipyrine test, is significantly inhibited in uterine fibroids, and treatment with synthetic progestins does not eliminate it. At the same time, the combined use of cobavit with narcolut, and especially migistron, leads to a clear restoration of the detoxifying potency of the liver and has a beneficial effect on the course of the disease. It should be noted that the restoration of the intensity of the processes of biotransformation of endo- and exogenous chemical substances in hepatocytes under the conditions of the use of cobavit probably enhances the metabolism and conjugation of sex hormones, which play a major role in the pathogenesis of the development of uterine fibroids.

Conclusion.

1. With uterine fibroids, the functional state of the MOS is clearly depressed.

2. Treatment with synthetic progestins does not eliminate MOC disorders.

3. The hepatoprotector cobavit is the drug of choice in the correction of disturbances in the detoxifying function of the liver in uterine fibroids.

4. In order to increase the effectiveness of conservative treatment of uterine fibroids, it is advisable to combine the use of synthetic progestins with cobavit

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THE EFFECT OF HYDROCORTISONE ON BONE MARROW IN ONTOGENESIS

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Аннотация

В статье представлена информация о применение кортикостероидных гормонов в клинике без учета генетической индивидуальности, сформированной в длительном процессе филогенеза, часто приводит к серьезным осложнениям. Устранить их будет возможно после глубокого сравнительного анализа гормонозависимых процессов иммуногенеза целостного организма. Раскрытие закономерностей ответной реакции иммунной системы черепах различного возраста на действие кортикостероидных гормонов, показанные на системном,клеточном и ультраструктурном уровнях позволяют дополнить механизмы патогенеза стресса, известные у млекопитающих и человека.

Ключевые слова: Иммуногенез, онтогенез, костный мозг, стресс, гидрокортизон, возраст, патогенез, млекопитающие, организм, ответная реакция, процесс.

INTRODUCTION

Compensatory and adaptive processes in the human and animal body to extreme environmental influences are closely associated with the immune status of the organism. The functional activity of the organs of the immune system is simultaneously under the regulatory influence of the neuroendocrine system, particularly the hormones of the adrenal glands. It has been established that adrenal cortex hormones participate in the mechanisms of seasonal biorhythms of immune system activity; moreover, it has been shown that small doses stimulate it, while large doses suppress it.

As is well known, a proper understanding of the formation processes of various structures of hematopoietic tissue can be achieved only through comparative and evolutionary studies of their ontogenesis—starting from the simplest chordate animals and progressing through fish, amphibians, reptiles, birds, mammals, and finally, to humans.

Reptiles are the first representatives of the amniotic group of vertebrates that possess a stable pulmonary type of respiration and lead a terrestrial lifestyle, while still being poikilothermic animals. They occupy a key position in the evolutionary lineage of vertebrates, as they are the ancestors of birds and mammals. The formation of the immune system in reptiles does not end during embryogenesis; after hatching, this process continues under the direct control of various types of hormones and tissue regulators.

MATERIALS AND METHODS OF RESEARCH

The object of our study was representatives of the reptile class — the Central Asian tortoise *Testudo horsfieldii*, which belongs to the order Chelonia. In the experiment, we used young individuals (hatchlings) weighing 30–90 g, sexually mature individuals weighing 200–250 g, and adults weighing 500–900 g, of both sexes. The animals were kept under laboratory conditions, with

the ambient temperature corresponding to the season. The Central Asian tortoise leads a sedentary lifestyle, entering a state of torpor during the winter period and awakening in March–April. It reaches sexual maturity at around ten years of age. The age of the tortoises was determined by the annual growth rings on the dorsal and ventral scutes of the shell.

Hydrocortisone (manufactured by Richter, Hungary) was administered intramuscularly into the thigh at a dose of 100 mg/kg of body weight, once during the spring-summer and autumn periods. The hormone dose was chosen based on literature data concerning the degree of lymphocyte elimination in the adrenal cortex of mammals and its effective impact on the organs of hemopoiesis and lymphopoiesis in lower vertebrates.

Control animals, kept under identical conditions, were injected with a 0.6% sodium chloride solution in a volume equal to that of the hormone suspension used in the experiment. The animals were euthanized by decapitation on the 9th–10th day after the administration of hydrocortisone, as the hormone reaches its maximum effect during this period.

For cytomorphological studies, samples of bone marrow were taken. For general morphological examinations, the material was fixed in Carnoy's fluid and 10% formalin, embedded in paraffin, and serial sections 3–5 μm thick were prepared. The paraffin sections were stained with hematoxylin and eosin (according to Karacci's method).

In addition, the fine structure of lymphoid organs and bone marrow was studied on semi-thin sections (1–2 μm). The organ samples were fixed in a 2.5% glutaraldehyde solution prepared in 0.1 M phosphate buffer with 1% sucrose added, for 90–120 minutes. After fixation in osmium tetroxide in the same buffer for 30–50 minutes, the samples were dehydrated in ascending concentrations of alcohol, then in absolute acetone, and embedded in a mixture of epon-araldite according to the standard technique (17). Sections (1–2 μm) prepared using an LKB-8800 ultratome were stained with 1% azure-eosin containing 1% borax for 5 minutes over an alcohol lamp flame.

RESEARCH

The bone marrow of reptiles is the main organ of hematopoiesis, where erythropoiesis, myelopoiesis, and lymphopoiesis occur throughout the entire postembryonic period. The lymphocytes formed in the bone marrow of reptiles represent a special population of B-lymphocytes responsible for the synthesis of immunoglobulins both under normal conditions and during antigenic stimulation. The unique microcirculatory system of the bone marrow is one of the most important components of its stroma: the walls of the bone marrow vessels form a barrier between the hematopoietic tissue and the bloodstream, providing conditions for the orderly migration of cellular elements. The stroma of the bone marrow, like that of other hematopoietic organs in reptiles, is composed of reticular cells and reticulin fibers, within whose loops the hematopoietic cells are located. Fat cells are often found in the bone marrow, and they constitute the main mass of the bone marrow cavity.

In amphibians and reptiles, during the winter period, hematopoietic bone marrow is normally replaced by fatty tissue, and in spring it is restored. Bone marrow stem cells are distributed throughout the organism, determining the development of various lymphoid elements. Therefore, the state of

the organism's immune system is defined by the combined activity of all structures involved in hemopoiesis and lymphopoiesis.

To date, it is firmly established that the main immunocompetent cellular elements responsible for the immune responses of the organism are T- and B-lymphocytes, their populations, as well as the macrophage cell system and granulocytes — all of which develop from hematopoietic stem cells. Although the existence of stem cells has been known for a long time, morphologically they are still not well characterized. Some authors suggest that small and medium lymphocytes, bone marrow monocytes, blast cells, and lymphocyte-like bone marrow cells may perform stem cell functions. Others believe that stem elements are cells distinct from both lymphocytes and the monocytic-macrophage cell line. It is thought that the pool of hematopoietic stem cells exists among the hydrocortisone-resistant lymphocyte-like cells of the bone marrow.

Interesting data have been obtained in studies of stem cell functions *in vitro*. When hematopoietic stem cells are cultured, colonies consisting of cells of a single histological type are formed: erythroid, granulocytic-macrophage, megakaryocytic colonies of T-lymphocytes, and colonies of B-lymphocytes.

The T-lymphocyte system is one of the most important components of immunity, responsible for mediating various reactions of cellular immunity. According to the generally accepted classification, the main populations of T-lymphocytes include T-helpers, T-killers, and T-suppressors. In addition to these subpopulations, other types of T-line cells have also been identified: T-amplifiers, T-initiators, X-differentiating lymphocytes, and T-regulators of helpers and suppressors. It has been established that the functional activity of T-suppressors is controlled by a special subpopulation known as "counter-suppressors."

The population of B-cells, like that of T-cells, is heterogeneous. In addition to B-lymphocytes that transform into plasma cells secreting antibodies, B-cells with suppressive activity have also been identified.

Macrophages are the third type of cells involved in the implementation of the immune response. In addition to capturing antigens and presenting them in an immunogenic form to other immunocompetent cells, macrophages also perform a range of other functions. The thymus, likewise, is not a homogeneous organ in terms of T-cell composition. Memory B-cells have been identified in the thymus of mice. The thymus of animals contains about 0.5% to 3% of immunoglobulin-bearing cells. The above description of the main cellular elements of the immune system has been obtained from studies primarily conducted on mammals, mostly on inbred strains of mice.

The immune system of reptiles, in terms of its morphological and functional characteristics, occupies an intermediate position in phylogeny—between amphibians and birds on one side, and mammals on the other. Many aspects of reptilian immune system functioning remain insufficiently studied. There is still no clear understanding of all the cellular elements that carry out immunological reactions in the organism. The processes of immune regulation and the interconnections between the immune system and other physiological systems remain largely unknown.

In mammals, such lymphocytes are regarded as natural killer cells. A portion of small and medium lymphocytes undergo destructive changes, including nuclear pyknosis and cytoplasmic vacuolization. With a significant reduction in the number of lymphoid elements, mature plasma cells become evident, and macrophages show active erythrocyte destruction.

Bone marrow**.** As is known, in the peripheral blood of adult tortoises, at all observation periods following the administration of hydrocortisone at a dose of 100 mg/kg, there is a pronounced heterophilic leukocytosis and lymphopenia. It was noted that by the 10th day, the absolute number of karyocytes in the bone marrow begins to decrease—mainly due to the reduction of lymphoid elements. Our experiments showed that in hatchling tortoises, by the 10th day after hydrocortisone administration at the same dose, the number of cellular elements was sharply reduced (Fig. 1). This phenomenon is especially noticeable in the disappearance of lymphoid elements and their replacement by clusters of granulocytes within the bone marrow tissue (Fig. 2)

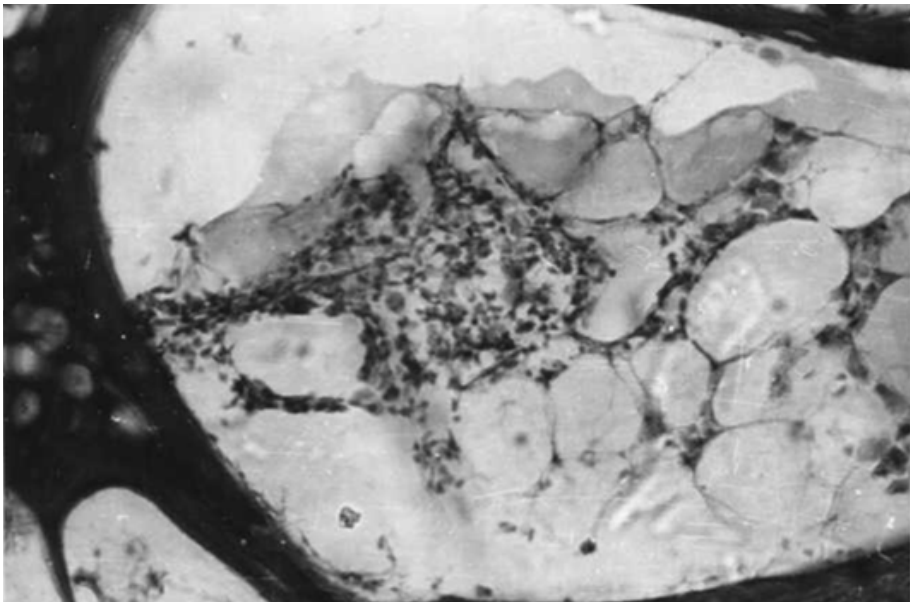

Fig. 1. Tortoise. Sexually mature. Bone marrow.

Reduction of hematopoietic islands. Magnification ×250.

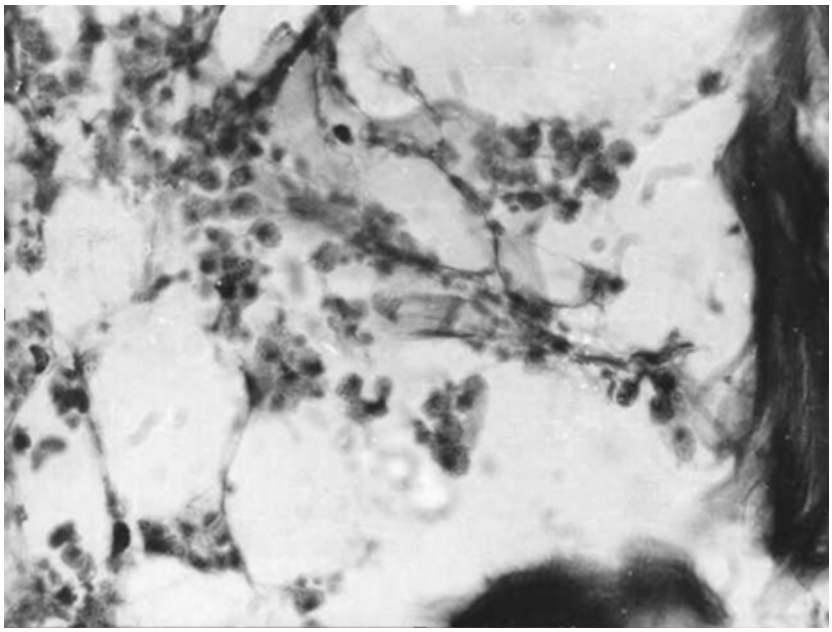

Fig. 2. Tortoise. Hatchling. Bone marrow.

Predominance of granulocytic series elements. Magnification ×500.

An increase in the elements of the proliferative pool of granulocytes in tortoises of all ages

occurs due to a rise in the number of myeloblasts and promyelocytes. At the same time, there is an increase in the number of mature heterophilic elements.When analyzing bone marrow smears, a specific phenomenon characteristic of tortoise heterophils should be noted. In close proximity to the sinusoids, clasmocytosis of these cells occurs—most prominently in animals that received hydrocortisone (Fig. 3).

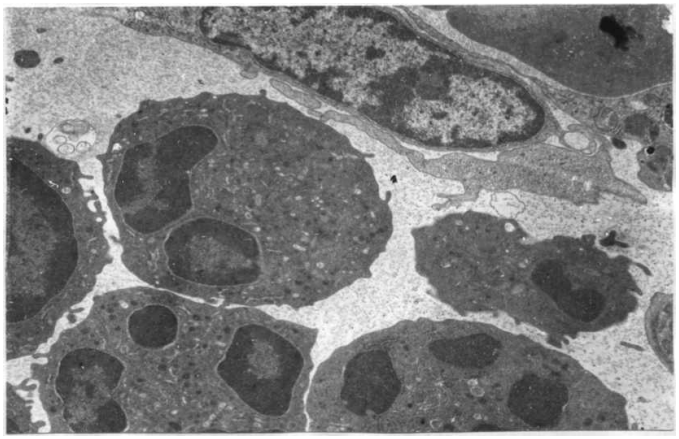

Fig. 3. Tortoise. Adult. Bone marrow.
Granulocytes after hydrocortisone administration. Magnification ×5,000

In the cytoplasm of heterophils, cytoplasmic degranulation and an increase in the number of vacuoles are observed (Fig. 4).

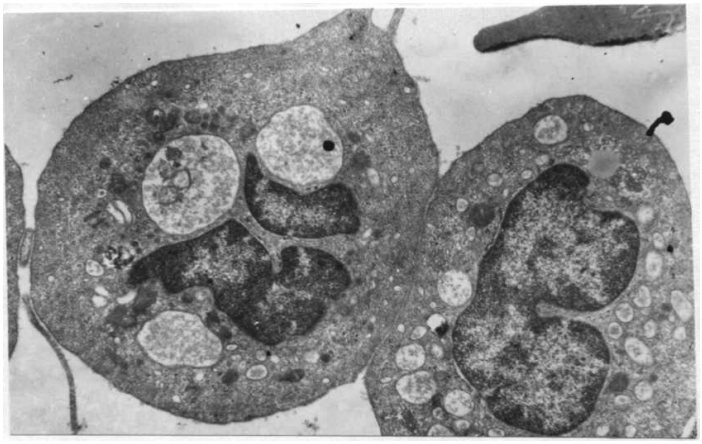

Fig. 4. Tortoise. Hatchling. Bone marrow.
After hydrocortisone administration. Heterophil. Magnification ×25,000.

The biological essence of the processes occurring in the bone marrow of experimental animals lies in the organism's defensive response under conditions of lymphoid tissue damage: redistribution of lymphoid elements, including precursors of T- and B-cells, and activation of macro- and microphage reactions.

CONCLUSIONS

1. A single administration of hydrocortisone at a dose of 100 mg/kg causes significant

structural and functional changes in the bone marrow of Central Asian tortoises, including lymphocytopenia, suppression of proliferative processes in the thymus and bone marrow, and involution of the organism's lymphoid tissue.

2. The hormone-induced reaction of the bone marrow in young tortoises (hatchlings) is less pronounced: inhibition of lymphocytopoiesis in the thymus is observed only in the cortical substance, whereas in adults, destruction occurs in both the cortical and medullary regions. The lymphoid tissue of the bone marrow is less affected in younger animals.

3. Following a single exposure to hydrocortisone, by the 10th day, ultrastructural changes develop in the bone marrow cells, indicating a disruption of the organism's immunological functions.

Summary

The use of pharmacological doses of hydrocortisone (as a model of stress reaction) in tortoises at various stages of postnatal ontogenesis made it possible to identify both the mechanisms of hormone-dependent immune system responses common to all vertebrates and the specific species-related characteristics.

Moreover, the bone marrow response in young tortoises demonstrates a certain tolerance to hydrocortisone, which is likely associated with the delayed development of the receptor system and the biochemical peculiarities of immunocompetent cells.

The elucidation of the patterns of immune system responses in tortoises of different ages to the effects of corticosteroid hormones—observed at systemic, cellular, and ultrastructural levels—helps to expand the understanding of stress pathogenesis mechanisms known in mammals and humans.

The use of evolutionarily ancient animals, which occupy a lower level of biological development, provides an opportunity to reveal the fundamental processes underlying the formation of morpho-functional systems and immunogenesis during the progressive evolution of organisms in phylogeny. These findings may be applied in developing therapeutic protocols for the clinical use of corticosteroid hormones in practical medicine.

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QANDLI DIABET SHAROITIDA TALOQ BEZINING GISTOSTRUKTURAL VA MORFOFUNKSIONAL O'ZGARISHLARI

Toshkent davlat tibbiyot universiteti talabasi

Izzatullayeva Mehruza

Annotatsiya. Ushbu maqolada qandli diabet sharoitida taloqbezining gistostruktural va morfofunksional o‘zgarishlari o‘rganildi. Diabet sharoitida organizmning immunobiologik himoya tizimi faoliyatida sezilarli buzilishlar yuzaga kelishi, xususan, limfoid to‘qimalarning atrofiya holatiga o‘tishi, germinativ markazlarning qisqarishi, oq qon tanachalarining tarkibiy o‘zgarishi va taloq kapillyarlarining morfometrik parametrlari kamayishi kuzatildi.Maqolada, shuningdek, taloqning qizil va oq pulpa zonalarida kechadigan gistostruktural buzilishlar, ularning to‘qima regeneratsiyasi va funksional kompensator mexanizmlariga ta’siri ham yoritib beriladi. Olingan natijalar asosida qandli diabet fonida taloqdagi immunologik zaiflik va to‘qimalarning degenerativ-distrofik o‘zgarishlari bilan bog‘liq morfologik o‘zgarishlar xulosalandi.Ushbu ilmiy ish diabetik holatlarda organizmning immun tizimi faoliyatini chuqur tushunishga hissa qo‘shadi hamda klinik va eksperimental morfologiya sohasida dolzarb muammolarni hal etishga yo‘naltirilgan. Kalit so’zlar.

Qandli diabet, taloq bezi, metabolitik buzilish, plazma, gistostruktura, glyukoza almashinuvi, insulin, oqsil sintezi, qon zaxirasi, immun tanqislik, sinnusoid kapilyar, makrofag, autoimmun reaksiya, immunoglobulin, germinativ markaz, atrofiya, deginiratsiya

Kirish.Bugungi kunda qandli diabet (diabetes mellitus) global sog‘liqni saqlash tizimi oldida turgan eng muhim va keng tarqalgan metabolik kasalliklardan biri hisoblanadi. Jahon sog‘liqni saqlash tashkiloti (JSST) ma’lumotlariga ko‘ra, dunyo bo‘yicha qandli diabet bilan kasallanganlar soni yildan-yilga ortib bormoqda, xususan, 2045-yilgacha bu raqam 700 milliondan oshishi kutilmoqda. Ushbu surunkali kasallik faqatgina glyukoza almashinuvi bilan bog‘liq muammolarni keltiribgina qolmay, balki organizmning barcha a’zolari va tizimlariga, ayniqsa qon-tomir, buyrak, asab va immun tizimlariga ham chuqur ta’sir ko‘rsatadi.Qandli diabet sharoitida ro‘y beradigan giperglikemiya, lipidlar va oqsillar almashinuvi buzilishi, oksidlovchi stress va yallig‘lanish holatlari immun tizim faoliyatining susayishiga olib keladi. Organizmning immunologik himoyasi zaiflashgan holatlarda esa infektsion kasalliklar xavfi ortadi, yallig‘lanishlarga qarshi kurashish mexanizmlari izdan chiqadi. Bu esa organizm uchun ikkilamchi asoratlar xavfini oshiradi. Shu nuqtai nazardan qaralganda, immun tizimining muhim tarkibiy qismi bo‘lgan taloq bezining qandli diabet fonida qanday o‘zgarishlarga uchrashi dolzarb ilmiy va amaliy masala sifatida qaralmoqda.Taloq (splen)

bezi – limfoid to‘qimalardan tashkil topgan, immun javob shakllanishida ishtirok etuvchi, eskirgan eritrotsitlar va qon elementlarini yo‘q qiluvchi, yangi limfotsitlar va antitanalar ishlab chiqarishda ishtirok etuvchi muhim a’zolardan biridir. Uning oq va qizil pulpa zonalari turlicha morfologik va funksional faoliyatga ega bo‘lib, limfoid elementlarning proliferatsiyasi, fagotsitoz va immun monitoring funksiyalarini bajaradi. Taloqning ushbu murakkab faoliyati qandli diabet sharoitida sezilarli darajada buzilishi mumkin.So‘nggi yillarda olib borilgan ilmiy izlanishlar qandli diabet sharoitida taloqning gistostrukturasi o‘zgarishini ko‘rsatmoqda. Xususan, oq pulpa zonasining qisqarishi, limfoid to‘qimalarning regressiyasi, germinativ markazlarning yo‘qolishi, kapillyarlarning devorlarida degenerativ-distrofik holatlar, makrofag va limfotsitlar tarkibining buzilishi kabi o‘zgarishlar qayd etilgan.

Ammo bu boradagi ilmiy ma’lumotlar ko‘proq tajriba hayvonlari asosida o‘rganilgan bo‘lib, ularni umumlashtirish, klinik va eksperimental jihatdan chuqur tahlil qilish hamda morfologik asoslarini yoritish dolzarb muammoligicha qolmoqda.Ushbu tadqiqot aynan shunday bo‘shliqlarni to‘ldirishga, qandli diabet fonida taloq bezining gistostruktural va morfofunksional o‘zgarishlarini aniqlash, ularning shakllanish mexanizmlari va oqibatlarini morfologik tahlil qilishga yo‘naltirilgan. Natijalar esa kelajakda qandli diabet bilan kasallangan bemorlar immun holatini baholash, asoratlarni oldini olish va immunokorreksiya usullarini ishlab chiqishda ilmiy asos bo‘lib xizmat qilishi mumkin.

Asosiy qism.

Qandli diabet: metabolik buzilish va umumiy ta’siri

Qandli diabet (diabetes mellitus) — bu glyukoza almashinuvi, insulin ishlab chiqarilishi yoki uning to‘qimalar tomonidan qabul qilinishidagi buzilishlar bilan bog‘liq bo‘lgan surunkali endokrin kasallikdir. Uning I va II turlari mavjud bo‘lib, har ikkisi ham organizmning ko‘plab tizimlariga, xususan, qon-tomir, asab, buyrak, yurak va immun tizimlariga zararli ta’sir ko‘rsatadi. Diabetning uzoq davom etishi organizmda giperglikemiya, dislipidemiya, yallig‘lanish jarayonlarining kuchayishi, oksidlovchi stress va angiopatiyaga olib keladi.Qandli diabet nafaqat energetik almashinuvni, balki immunologik barqarorlikni ham izdan chiqaradi. Shuning uchun bu kasallik nafaqat “metabolik sindrom”, balki “immunologik yetishmovchilik” fonida kechuvchi tizimli holat sifatida qaralmoqda. Ayniqsa, immun tizimining ikkilamchi limfoid organi bo‘lgan taloq bezida kechuvchi gistostruktural o‘zgarishlar ilmiy nuqtai nazardan alohida e’tiborga loyiqdir.Qandli diabet nafaqat energetik almashinuvni, balki immunologik barqarorlikni ham izdan chiqaradi. Shuning uchun bu kasallik nafaqat “metabolik sindrom”, balki “immunologik yetishmovchilik” fonida kechuvchi tizimli holat sifatida qaralmoqda. Ayniqsa, immun tizimining ikkilamchi limfoid organi bo‘lgan taloq bezida kechuvchi gistostruktural o‘zgarishlar ilmiy nuqtai nazardan alohida e’tiborga loyiqdir.

Taloq bezining gistostrukturasi va fiziologik roli

Taloq (lien, splen) — immun tizimning eng yirik ikkilamchi limfoid organi hisoblanadi. U qorin bo‘shlig‘ining chap yuqori kvadrantida joylashgan bo‘lib, limfoid to‘qimalar, qon ombori va fagotsitar hujayralardan tashkil topgan.

Taloq quyidagi asosiy qismlardan iborat:

Oq pulpa – limfoid tugunchalar, T- va B-limfotsitlar zonasi, periarteriolyar limfoid manzillardan tashkil topgan. Bu qism immun javob shakllanishida ishtirok etadi.

Qizil pulpa – qon bilan to‘lgan sinusoidlar, retikuloendotelial hujayralar, makrofaglar va boshqa elementlardan iborat. U eskirgan eritrotsitlarni yo‘q qilish, fagotsitoz, plazmada mavjud yot zarrachalarni yo‘qotish funksiyalarini bajaradi.

Taloq organizmda ikkita asosiy vazifani bajaradi:

Immunologik vazifa – antigenlarga javob berish, limfotsitlar differensiasiyasi, antitana ishlab chiqarish;

Filtrlovchi (gematologik) vazifa – qon elementlarini tozalash, eskirgan hujayralarni yo‘qotish.

Bu a’zo immunitetning markaziy elementi hisoblanib, har qanday tizimli kasallikda, xususan, qandli diabetda, uning strukturaviy, funksionalva morfologik holati sezilarli darajada o‘zgaradi.

Qandli diabet sharoitida taloq bezining gistostruktural o’zgarishlari.

lmiy adabiyotlar tahliliga ko‘ra, qandli diabet sharoitida taloq bezida bir qator muhim morfologik o‘zgarishlar ro‘y beradi. Bu o‘zgarishlar giperglikemiya, surunkali yallig‘lanish va oksidlovchi stress bilan bevosita bog‘liq. Taloqning har ikkala zonasi – oq va qizil pulpa ham ushbu patologik jarayonlardan zararlanadi.

Oq pulpa o‘zgarishlari:

Limfoid tugunchalarning hajmi kichrayadi,bu B-limfotsitlar ishlab chiqarilishi va immun javob kuchsizlanishini bildiradi;

Germinativ markazlar zaiflashadi yoki butunlay yo‘qoladi, bu immun tizimdagi proliferativ faollikning sustlashganidan darak beradi;

limfotsitlar zonasi siyraklashadi, T-hujayralar soni kamayadi, bu esa hujayraviy immunitetning pasayishiga olib keladi;

Apoptozga uchragan limfotsitlar soni oshadi, bu esa yallig‘lanish reaksiyalarining kuchayishiga xizmat qiladi.

Qizil pulpa o‘zgarishlari:

Sinusoid kapillyarlarning kengayishi va devorlarining yupqalashuvi kuzatiladi;

Makrofag va retikuloendotelial hujayralarning disfunktsiyasi qayd etiladi, bu fagotsitar faollikni pasaytiradi;

Qon elementlari filtrasiyasi buziladi, eritrotsitlar parchalanishi sekinlashadi;

Sklerotik o‘choqlar va gemorragik diapedeslar ko‘payadi.

Ushbu gistostruktural o‘zgarishlar taloqning normal immun va qon tozalovchi funksiyalarini buzadi. Bu esa diabetik bemorlarda immun yetishmovchilik holatlarini kuchaytiradi.

Morfofunksional o‘zgarishlarning klinik va immunologik oqibatlari.

Taloqdagi gistostruktural buzilishlar klinik jihatdan quyidagilarga olib keladi

Immun tanqislik holatlari – bakterial, virusli va zamburug‘li infektsiyalarga nisbatan sezuvchanlik ortadi;

Surunkali yallig‘lanishlar – diabetik angiopatiya, nefropatiya va boshqa asoratlarning rivojlanish xavfi ortadi;

Autoimmun reaksiyalar kuchayadi, bu esa diabetga hamroh bo‘lgan boshqa autoimmun kasalliklar (masalan, tireoidit, revmatoid artrit) rivojlanish ehtimolini oshiradi;

Oqsil sintezi va immunoglobulinlar ishlab chiqarilishi kamayadi, bu esa zaxiralovchi antitanalar darajasini pasaytiradi;

Qon zaxirasining zaiflashishi – bu taloqdagi eritrotsitlar, trombotsitlar va limfotsitlar resursining buzilishi bilan bog‘liq bo‘lib, organizmning umumiy gomeostaziga zarar yetkazadi.Shuningdek, retikuloendotelial tizimning faoliyati izdan chiqishi bilan bog‘liq immun tanqislik holatlari kuzatilgan. Bu o‘zgarishlar klinik amaliyotda bemorlar immun holatini baholashda va immunokorreksiya usullarini ishlab chiqishda muhim rol o‘ynaydi.

Taloqdagi o‘zgarishlarning molekulyar-biokimyoviy asoslari

Qandli diabetda taloq bezining gistostruktura va funksiyalaridagi o‘zgarishlar faqat morfologik darajada emas, balki molekulyar va biokimyoviy bosqichlarda ham yuzaga keladi. Diabet bilan bog‘liq surunkali giperglikemiya holatida reaktiv kislorod turlari ning ortiqcha hosil bo‘lishi natijasida oksidlovchi stress kuchayadi. Bu esa hujayra membranasi komponentlari, DNK va oqsillarni shikastlaydi.Taloqdagi immun hujayralar (T- va B-limfotsitlar, makrofaglar) ushbu stressga juda sezuvchan bo‘lib, ularning proliferatsiyasi va funksional faolligi pasayadi. Shu bilan birga, NF-κB singari yallig‘lanishni faollashtiruvchi transkripsion omillar faollashadi, bu esa proinflamator sitokinlar ishlab chiqarilishini orttiradi.

Ushbu sitokinlar ta’sirida:

Limfoid to‘qimalarda atrofiya va degeneratsiya yuzaga keladi;

Taloqdagi sinusoid tomirlar endoteliysi shikastlanadi;

Hujayra o‘limi (apoptoz) kuchayadi;

Immun hujayralar migratsiyasi va muvofiqlashtirilgan faolligi buziladi.Bu esa taloqning immunogen javob qaytarish qobiliyatini sezilarli darajada susaytiradi.

Taloqdagi o‘zgarishlarning immunologik oqibatlari

Taloq immun tizimining markaziy “monitoring” a’zosi bo‘lib, unda antigenlar tan olinadi, zarur limfotsitlar shakllanadi va fagotsitar tozalash jarayonlari amalga oshiriladi. Qandli diabetda bu jarayonlar izdan chiqadi:

Antigen taqdim etuvchi hujayralarning soni kamayadi, bu esa immun javobning boshlanishini kechiktiradi;

T-limfotsitlar va B-limfotsitlar aktivatsiyasi sustlashadi, oqibatda antitana ishlab chiqarilishi kamayadi;

Makrofaglar faoliyati buziladi, bu esa fagotsitoz va infeksiyalarga qarshi kurashni zaiflashtiradi;

Sitotoksik T-hujayralar soni kamayadi, bu esa virusli infeksiyalarni aniqlash va yo‘q qilishni qiyinlashtiradi;

Taloqning immun nazorati susayadi, bu esa avtoimmun va yallig‘lanishli kasalliklarning kuchayishiga olib keladi.

Ko‘plab klinik kuzatuvlarda qandli diabetli bemorlarning bakterial va virusli infeksiyalarga nisbatan chidamliligi pastligi aniqlangan bo‘lib, buni aynan taloqdagi immun va morfologik buzilishlar bilan izohlash mumkin.

Diabet fonida taloqdagi angionevrotik va degenerativ jarayonlar Qandli diabetning yana bir muhim ta’siri — angiopatiya, ya’ni kichik qon tomirlarning buzilishi orqali amalga oshadi. Taloq tomirlarining devorlari ingichka va sezuvchan bo‘lgani sababli, diabet sharoitida:

Kapillyar va venula devorlari qalinlashadi, bu esa perfuziya yetishmovchiligiga olib keladi.

Sinusoidal tomirlar kengayadi, ba’zi joylarda mikroanevrizma va diapedetik qon quyilishlar yuzaga keladi;

Taloqning nerv elementlarida degeneratsiya boshlanadi, bu esa vegetativ regulyatsiya buzilishiga sabab bo‘ladi;

Fibroz va skleroz o‘choqlari paydo bo‘ladi, bu esa to‘qimaning funksional qismini almashtiradi.

Yuqoridagi jarayonlar taloqni nafaqat immun, balki gematologik jihatdan ham nofaol a’zoga aylantirib qo‘yadi. Oqsil sintezi, hujayra regeneratsiyasi va filtratsion faollikning izdan chiqishi organizmning umumiy holatiga salbiy ta’sir ko‘rsatadi.

Qandli diabet va taloq: klinik jihatdan amaliy ahamiyati

Taloqdagi o‘zgarishlar ko‘p hollarda klinik jihatdan yashirin kechadi. Ammo diabetga chalingan bemorlarda ushbu o’zgarishlar kuzatiladi:

Surunkali bronxit va pnevmoniyalarning ko‘payishi;

Yara va nekrotik jarayonlarning uzoq bitmasligi;

Virusli infeksiyalarning uzoq davom etishi;

Revmatik yoki avtoimmun sindromlar;

Shuningdek, limfotsitoz, limfopeniya, trombotsitopeniya kabi laborator ko‘rsatkichlar bevosita taloqdagi strukturaviy va funksional buzilishlar bilan bog‘liq bo‘ladi.Shu bois, diabetik bemorlarning umumiy ahvolini baholashda taloq bezining strukturasi va faoliyatiga e’tibor qaratish, zamonaviy diagnostik vositalar yordamida u yerda kechayotgan o‘zgarishlarni erta aniqlash muhim klinik ahamiyatga egadir.

Xulosa.Qandli diabet organizmning barcha hayotiy tizimlariga, jumladan, immun tizimining asosiy a’zolaridan biri bo‘lgan taloq beziga ham salbiy ta’sir ko‘rsatadi. Diabet sharoitida rivojlanadigan surunkali giperglikemiya, oksidlovchi stress, mikroangiopatiya va yallig‘lanish reaksiyalarining kuchayishi taloq to‘qimalarida chuqur morfologik va funksional o‘zgarishlarga olib keladi Ushbu o‘zgarishlar natijasida taloqning asosiy vazifalari — immunologik himoya, antigenlarga javob shakllantirish va fagotsitar tozalash jiddiy darajada izdan chiqadi.Diabet bilan bog‘liq bu kabi o‘zgarishlar bemorlarda infeksion kasalliklarga nisbatan sezuvchanlikni oshiradi, immun yetishmovchilik holatlari va surunkali yallig‘lanish jarayonlarini kuchaytiradi. Shu bois, qandli diabet kasalligini kompleks yondashuv asosida davolashda taloq bezining gistostruktura va funksional holatini o‘rganish va nazorat qilish muhim amaliy ahamiyat kasb etadi.T

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AGRAR SOHA KORXONALARI FAOLIYATINI RIVOJLANTIRISHDA DIVERSIFIKATSIYALASH STRATEGIYASI

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Аннотация: Мақолада агросаноат корхоналари фаолияти самарадаорлиги ошириш омили сифатида ишлаб чиқаришни диверсификациялаш масалалари кўриб чиқилган. Агросаноат корхоналарида диверсификациялашнинг ўзига хос жиҳатлари асослаб берилган, ҳамда қишлоқ хўжалик корхоналари фаолиятини диверсификациялаш стратегиясининг асосий йўналишлари шакллантирилган.

Калит сўзлар: диверсификация, қишлоқ хўжалиги, стратегия, бошқарув, интеграциялаштириш салоҳияти, интеграциялашувни ривожлантириш йўналишлари, интеграциялаштириш модели.

Аннотация: В статье рассмотрены вопросы диверсификации производства, как фактор повышения эффективности предприятий аграрной промышленности. Обоснованы специфические аспекты диверсификации на предприятиях аграрной промышленности и сформированы основные направления стратегии диверсификации предприятий сельского хозяйства.

Ключевые слова: диверсификация, сельское хозяйство, стратегия, управление, потенциал интеграции, направления развития интеграции, модель интеграции.

Annotation: Considered the issues related to the divestment as a process of increasing the economic efficiency of enterprises. Features of diversification in agricultural production. Formulated alternative strategies of diversification of agricultural enterprises.

Keywords: a diversification, agriculture, strategy, management, economic efficiency. integration potential; directions of development integration; integration model.

Respublikamiz agrar sohasida amalga oshirilayotgan iqtisodiy islohotlarning bugungi bosqichidagi muhim xususiyatlaridan biri – sohaga ilmiy sig‘imi yuqori bo‘lgan, resurstejamkor, innovatsion g‘oya va fan yuutuqlariga asoslangan ishlab chiqarishning kirib kelishi hisoblanadi.

Bu o‘z navbatida milliy iqtisodiyotimiz barqarorligini ta’minlashga xizmat qiladigan

agrar soha tarmoq tuzilishini shakllantirishi bilan birga, sohadagi xo‘jalik yurituvchi subyektlar o‘rtasida raqobatni kuchaytirib, ularning nafaqat ichki bozorlarda balki tashqi bozorlarda ham raqobatbardosh bo‘lishini ta’minlamoqda.

Darhaqiqat, mahsulot va resurslar bozorida raqobat kuchaygan sari aksariyat qishloq xo‘jalik korxonalari uchun qishloq xo‘jalik mahsulotlari ishlab chiqarishni takomillashtirish, qayta ishlash korxonalari ehtiyojidan kelib chiqqan holda, assortiment hamda qishloq xo‘jalik mahsulotlari bozori konyukturasini kengaytirishning ahamiyati ortib boradi. Bu o‘z navbatida, istiqbolda qishloq xo‘jalik mahsulotlarini yetkazib beruvchilar va qayta ishlash korxonalarining o‘zaro birgalikdagi faoliyatini olib borish hamda hamkorlikni amalga oshirishning yangi samarali mexanizmini ishlab chiqish va uni joriy etishni zaruriyatga aylantiradi.

Bunday sharoitda xo‘jalik subyektlari xo‘jaliknig uzluksiz rivojlanishni ta’minlash maqsadida, bir tomondan o‘zlarining uzoq muddatli strategik rejalarini tuzib olishlari lozim bo‘lsa, ikkinchi tomondan, esa ular korxonadagi mavjud ishlab chiqarish ixtisoslashuviga muqobil yo‘llarni izlashlari kerak bo‘ladi. Istiqbolli rejalashtirishning strategik muqobillaridan biri diversifikatsiya hisoblanadi.

Ishlab chiqarishni diversifikatsiyalash – bu korxonada ishlab chiqarilayotgan mahsulotlar assortimentini kengaytirish, mahsulot turini o‘zgartirish, ishlab chiqarish samaradorligini oshirish, iqtisodiy jihatdan foydaga erishish, inqirozning oldini olish maqsadida ishlab chiqarishning yangi turlarini o‘zlashtirishdir.

Ishlab chiqarishni diversifikatsiyalash ko‘pincha mahsulot va xizmatlar sifatining oshirilishiga olib keladi. Chunki, ishlab chiqaruvchining mahsulot yangi turlarini o‘zlashtirish bilan bir qatorda ularning iste’mol xususiyatlarini yaxshilashga intilishi pirovardida, sifat darajasining o‘sishini ta’minlaydi. Bu esa, mazkur mahsulotni sotish hajmining ko‘payishi bilan birga ularni sotish bozorlarining kengayishiga ta’sir ko‘rsatadi[1].

Diversifikatsiya bir turdagi mahsulotni ommoviy ishlab chiqarish samarasini, turli mahsulotlar ishlab chiqarish orqali o‘sish strategiyasini amalga oshirish hisobiga siqib chiqardi. Turli mahsulotlar ishlab chiqarish samarasining mohiyati shundaki, ko‘p turdagi mahsulotlarni bitta yirik korxonada ishlab chiqarishga nisbatan shu turdagi mahsulotlarni katta bo‘lmagan ixtisoslashgan korxonalarda ishlab chiqarish foydaliroqdir.

Diversifikatsiyalashning asosiy maqsadi bir nechta tarmoqda faoliyat olib borish hisobiga foydani oshirish hamda risk darajasini kamaytirish hisoblanadi. Diversifikatsiyalashgan korxonalar raqobat kurashida barqarorroq bo‘lib, ularda konyuktura, tuzilmaviy hamda sikl o‘zgarishlari hisobiga yuzaga keladigan risk darajasi pastroq bo‘ladi.

Diversifikatsiyalash xo‘jalik subyektlarini rivojlantirishning umumqabul qilingan zaruriy usullaridan hisoblanadi.

Bugungi kunda, qishloq xo‘jalik mahsulotlarini ishlab chiqaruvchilar bilan ushbu mahsulotlarni qayta ishlovchilar o‘rtasidagi faoliyatni yo‘lga qo‘yishning yangi mexanizmlarini yaratish zaruriyati, mavjud ishlab chiqarishni optimallashtirish va

qayta ishlash korxonalari talablaridan kelib chiqqan holda, yangi ishlab chiqarishlarni joriy etish zaruriyati bilan uyg‘unlashib borayotganligi bois, agrar soha korxonalarini diversifikatsiyalashning dolzarbligi yanada ortib bormoqda.

Fikrimizcha, agrar sohada diversifikatsiyalash dasturiy tadbirlarini shakllantirish va amalga oshirish to‘g‘risida qaror qabul qilishda, qishloq xo‘jaligining o‘ziga xos xususiyat va jihatlarini e’tiborga olish maqsadga muvofiq:

- ishlab chiqarishning mavsumiylik xarakterdaligi;

- biologik va iqtisodiy jarayonlarning qo‘shilib ketishi;

- yerning ishlab chiqarish vositasi sifatida qaralishi va boshqalar.

Aynan, mana shu o‘ziga xoslik qishloq xo‘jaligi korxonalarining ish faoliyati natijalari va uning iqtisodiy samaradorligiga ko‘p jihatdan bog‘liqdir.

Ishlab chiqarishni diversifikatsiyalash jarayoni uzoq muddatli istiqbolda korxonaning iqtisodiy va moliyaviy jihatdan yuksalishiga olib kelsada, ahamiyatli darajadagi sarf-xarajatlarni taqozo etishi sababli joriy natijalarga sezilarli ta’sir ko‘rsatishi mumkin. Bu esa korxona faoliyati bilan bog‘liq bo‘lgan turli iqtisodiy subyektlarning manfaatlariga ham turlicha ta’sir ko‘rsatadi[1].

Tadqiqotlar ko‘rsatishicha, bugungi kunda integratsiyalashgan tizimlarni shakllantirish, ular faoliyatini tashkil etish va rivojlantirishga quyidagi omillar to‘sqinlik qilmoqda:

- qishloq xo‘jaligiga nisbatan qayta ishlash sanoatida ijtimoiy mehnat unumdorligi darajasining birmuncha yuqori darajada ekanligi;

- agrosanoat majmuiga kiruvchi aksariyat korxonalarda integratsiyalashgan tuzilmalarni yaratishga bo‘lgan manfaatdorlikning birmuncha sust rivojlanayotganligi;

- integratsiyalashgan tuzilmalarni shakllantirish va ular faoliyatini tashkil etish sohasida huquqiy bazaning takomillashmaganligi;

- tarmoqning va hududning o‘ziga xos tomonlarini hisobga olgan holda, agrosanoat integratsiyasi shaklini tanlashga imkon beradigan ilmiy asoslangan uslubiyotni takomillashtirishga bo‘lgan zaruriyat;

- agrosanoat majmuasi korxonalari moliyaviy holatining qoniqarli darajada emasligi va ko‘pchilik qishloq xo‘jalik tashkilotlarining to‘lov qobiliyatining korxonada kengaytirilgan takror ishlab chiqarishni amalga oshirish uchun moliyaviy imkoniyatlarining cheklanganligi;

- qishloq xo‘jalik va qayta ishlash korxonalari moddiy-texnikaviy salohiyatining pastligi boshqalar.

Ishlab chiqarishni diversifikatsiyalash iqtisodiy samaradorligini hisoblashda quyidagilarni e’tiborga olish zarur:

- divesifikatsiya natijasida olingan qo‘shimcha daromad;

- ishlab chiqarishni diversifikatsiyalash hisobigan mahsulot bozoridagi infohratuzilma xizmatlaridan foydalanish imkoniyatining oshganligi;

- xizmatlardan foydalanish ko‘lamining oshganligi va tovar mahsulot sotish hajmining oshganligi bois, xarajatlarning qisqarishi, tannarxining pasayishi;

- yangi mahsulot ishlab chiqarishni o‘zlashtirilishi va bunga mos ravishda innovatsion texnologiyalarning kirib kelishining kuchayishi va boshqalar;

Diversifikatsiyalash strategiyasini qo‘llash har doim ham qishloq xo‘jaligi korxonalariga muvaffaqiyat keltirmaydi, shu boisdan ham rahbariyat doimiy ravishda uni qo‘llashning oqibatlarini tahlil qilib borishi, agar faoliyat samarasiz bo‘lsa, faoliyat yo‘nalishiga tegishli o‘zgartirishlar kiritishi kerak.

Bunday holatda rivojlangan mamlakatlar tajribasiga asoslanib, quyidagi muqobil strategiyalar taklif etilishi mumkin:

- yangi tarmoqlarda mavqega ega bo‘lish yoki diversifikatsiyalashgan faoliyat yo‘nalishlaridagi mavqeni mustahkamlash maqsadida boshqa tarmoqlarga kirib borish yoki yangi vositalarga egalik qilish;

- korxonaning iqtisodiy strategiyasiga javob bermayotgan faoliyat yo‘nalishlaridan voz kechish;

- diversifikatsiya bazasini qisqartirish, jumladan, kuchsiz yo‘nalishlarni yo‘q qilish yo‘li bilan;

- samaradolik darajasi past bo‘lgan, foyda keltirmayotgan, shuningdek, zarar keltirayotgan bo‘linmalar faoliyatini to‘xtatish hamda ishlab chiqarish yo‘nalishlarini yopish[2].

Xulosa qiladigan bo‘lsak, qishloq xo‘jalik korxonalari faoliyatini diversifikatsiyalash strategiyasini tanlash ularning ichki hamda tashqi iqtisodiy muhiti salohiyati bilan aniqlanadi. Qishloq xo‘jalik korxonalari faoliyatini diversifikatsiyalash strategiyasini tanlashning tashkiliy – iqtisodiy mexanizmi o‘z ichiga strategik ko‘ra bilishlikni, uning ichki va tashqi muammolarini tarkiblashni, missiyasi va maqsadlarini shakllantirishni, strategik tahlil qilishni, strategik muqobillarni aniqlashni, strategiyani tanlashni, uning bajarilishi ustidan nazorat o‘rnatishni hamda samaradorligini aniqlashni o‘z ichiga oladi.

Yuqorida bildirilgan uslubiy yondashuv va amaliy tavsiyalarni amaliyotga qo‘llash respublikamiz agrar soha va tarmoqlari korxonalari samaradorligini diversifikatsiyalash strategiyasi asosida oshirishni ta’minlashga xizmat qiladi.

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“PSIHO-ENDOKRINOLOGIK O’ZGARISHLARNING O’SMIRLAR RUHIY SALOMATLIGIGA TASIRI”

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ANNOTATSIYA: Maqolada o‘smirlik (pubertat) davrida endokrin tizimda kechuvchi gormonal o‘zgarishlarning o‘smirlar ruhiy salomatligiga ta’siri ilmiy tahlil qilinadi. Gormonlarning — xususan estrogen, testosteron, kortizol, dopamin va serotonin darajalarining — kayfiyat, o‘zini baholash va ijtimoiy xulqqa ta’siri ko‘rib chiqiladi. Tadqiqotda o‘smirlik davrida kuzatiladigan psixologik beqarorlik, stressga moyillik, o‘z tanasini qabul qilmaslik kabi holatlar gormonal o‘zgarishlar bilan uzviy bog‘liqligi yoritilgan. Maqolada psixo-endokrinologik yondashuvning pediatriya amaliyotidagi ahamiyati va o‘smirlar bilan ishlovchi mutaxassislar uchun amaliy tavsiyalar keltiriladi.

KALIT SO‘ZLAR: pubertat, gormonlar, psixo-endokrinologiya, o‘smirlik davri, ruhiy salomatlik, stress, o‘zini baholash.

O‘smirlik (pubertat) davri inson hayotidagi eng murakkab fiziologik va psixologik bosqichlardan biridir. Bu davrda endokrin tizimning faoliyati kuchayib, jinsiy bezlar, gipofiz va gipotalamus o‘rtasidagi gormonal muvofiqlashuv tizimi faol ishlay boshlaydi. Ushbu jarayon natijasida estrogen, testosteron, kortizol, dopamin va serotonin kabi biologik faol moddalar darajasi o‘zgaradi. Aynan shu gormonlar o‘smirning nafaqat jismoniy rivojlanishida, balki uning hissiy holati, kayfiyati, o‘zini baholashi va ijtimoiy xulqida ham muhim rol o‘ynaydi. Pubertat davri o‘smirning o‘zini kashf etish, shaxsiy “men”ini shakllantirish va ijtimoiy muhitda o‘rnini topish jarayoni bilan kechadi. Shu sababli gormonal o‘zgarishlar bilan bir paytda kechuvchi psixologik beqarorlik — tabiiy, ammo nozik holatdir. Agar bu jarayon nazoratdan chiqsa yoki tashqi omillar (stress, oilaviy muhit, ijtimoiy bosim) bilan kuchaysa, ruhiy salomatlik buzilishlariga olib kelishi mumkin. Shu nuqtai nazardan, psixo-endokrinologik tahlil o‘smirlik davrini chuqurroq tushunish uchun muhim ilmiy yondashuv hisoblanadi.

Pubertat jarayonida gormonlar markaziy asab tizimining faoliyatiga bevosita ta’sir ko‘rsatadi. Gormonlar va neyrotransmitterlar o‘rtasida kuchli o‘zaro aloqadorlik mavjud: masalan, testosteron va estrogen miqdorining o‘zgarishi serotonin va dopamin almashinuvi bilan chambarchas bog‘liq. Bu esa o‘smirning kayfiyat barqarorligi, moti-

vatsiyasi va o‘zini baholash darajasiga bevosita ta’sir qiladi.

Estrogen qizlarda hissiy barqarorlik va empatiya bilan bog‘liq bo‘lsa-da, uning keskin ko‘tarilishi yoki pasayishi tez-tez kayfiyat o‘zgarishlari, yig‘loqilik, o‘ziga ishonchsizlik va tashvish hissini keltirib chiqarishi mumkin. Shu bilan birga, estrogen miyada serotonin ishlab chiqilishini rag‘batlantiradi, bu esa qisqa muddatli eforiya, ammo uzoq muddatda hissiy charchoqqa olib kelishi mumkin.

Testosteron o‘g‘il bolalarda mustaqillik hissi, o‘zini himoya qilish instinkti va raqobatga moyillikni oshiradi. Biroq bu gormonning haddan tashqari ko‘payishi agressivlik, impulsiv xatti-harakat va konfliktlarga moyillikni kuchaytiradi. Aksincha, testosteron darajasining pastligi o‘smirda o‘ziga ishonchsizlik, ijtimoiy chekinish va depressiv holatlarni yuzaga keltiradi.

Kortizol – stress gormoni sifatida tanilgan bo‘lib, o‘smirlik davrida uning o‘zgarishlari ayniqsa sezilarli. Haddan ortiq kortizol darajasi uyqusizlik, diqqat susayishi va hissiy toliqish holatini chaqiradi. Agar o‘smirda ijtimoiy qo‘rquv yoki oilaviy ziddiyatlar mavjud bo‘lsa, kortizol sekretsiyasi ortib, bu ruhiy beqarorlikni kuchaytiradi.

Dopamin va serotonin — “baxt gormonlari” sifatida tanilgan neyrotransmitterlar — o‘smirlik davrida motivatsiya, ijtimoiy faollik va o‘zini qabul qilish hissini boshqaradi. Biroq gormonal o‘zgarishlar davrida ularning muvozanati buzilishi, o‘smirda hissiy keskinlik, sababsiz xavotir yoki tez charchash kabi holatlarni keltirib chiqaradi. Bu jarayonlarning barchasi psixo-endokrin muvozanat tushunchasini yuzaga keltiradi. Ya’ni, gormonlar va ruhiy holat o‘rtasidagi o‘zaro ta’sir ikki tomonlama kechadi: gormonlar psixologik holatni o‘zgartirsa, stress va hissiy bosim ham gormonal faoliyatga ta’sir ko‘rsatadi. Masalan, o‘smirlikda uzoq davom etgan psixologik stress gipotalamus-gipofiz-buyrak usti o‘qi faoliyatini buzib, kortizol ishlab chiqilishini oshiradi; bu esa, o‘z navbatida, immun tizim va asab tizimining muvozanatini buzadi.Ijtimoiy muhit ham bu jarayonlarda muhim o‘rin tutadi. Bugungi kunda o‘smirlar o‘z tengdoshlari bilan ijtimoiy tarmoqlarda taqqoslanadi, ideal tashqi ko‘rinish me’yorlariga mos kelmaslik ularda psixologik noqulaylik tug‘diradi. Ayniqsa, qizlarda estrogenning o‘zgaruvchanligi fonida o‘z tanasidan qoniqmaslik kuchayadi, bu esa o‘zini past baholash va depressiyaga moyillikni oshiradi.Shu bois, pubertat davrida ruhiy salomatlikni qo‘llab-quvvatlash faqat psixologik yondashuv bilan emas, balki endokrin mexanizmlarni ham inobatga olgan holda amalga oshirilishi zarur. Shifokor, psixolog va ota-ona hamkorligida o‘smirning fiziologik o‘zgarishlariga mos psixologik yordam ko‘rsatilsa, bu jarayon tabiiy, og‘riqsiz va barqaror kechadi.

Xulosa qilib aytganda, Pubertat davri — bu faqat fiziologik o‘zgarishlar bosqichi emas, balki inson ruhiyati, o‘zini anglash va shaxs sifatida shakllanish davridir. Aynan shu paytda gormonal muvozanatdagi eng kichik o‘zgarish ham o‘smirning hissiy holati, fikrlashi va xulqida sezilarli aks etadi. Shu sababli bu davrni to‘g‘ri tushunish,

o‘smirni faqat “kayfiyati o‘zgaruvchan” deb baholamasdan, balki undagi har bir hissiy tebranish ortida fiziologik mexanizmlar borligini anglash juda muhimdir.Tadqiqotlar shuni ko‘rsatadiki, endokrin tizimdagi har bir o‘zgarish ruhiy salomatlikka bevosita ta’sir qiladi. Estrogen va testosteronning notekis sekretsiyasi, kortizolning ortishi yoki dopaminning pasayishi — bularning barchasi o‘smir kayfiyati, o‘zini baholashi va hayotga qarashiga ta’sir etuvchi asosiy omillardir. Demak, ruhiy barqarorlik — bu nafaqat psixologik, balki fiziologik muvozanatni ham talab qiladigan holatdir.Bugungi kunda tibbiyot shunchaki kasallikni davolash bilan cheklanmasligi, balki insonning ruhiy va gormonal uyg‘unligini ta’minlashga ham e’tibor qaratishi kerak. Chunki har bir o‘smir — bu kelajakdagi yetuk shaxs, va u sog‘lom, barqaror psixika bilan voyaga yetishi uchun tibbiy, ijtimoiy va oilaviy qo‘llab-quvvatlov zarur.

Menimcha, eng muhim narsa — bu davrni “muammo” deb emas, balki inson rivojlanishidagi tabiiy bosqich deb qabul qilishdir. To‘g‘ri yondashuv, sabr va tushunish orqali o‘smir o‘zini anglashni, his-tuyg‘ularini boshqarishni o‘rganadi. Va aynan shunda pubertat davridagi gormonal o‘zgarishlar insonning yetuk, mustahkam va ruhiy jihatdan sog‘lom shaxsga aylanishida poydevor vazifasini bajaradi.

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PEDIATRIYADA SUN'IY INTELEKTNING DOLZARBLIGI

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Annotatsiya:

Ushbu maqolada pediatriyada sun'iy intellektning (SI) roli va ahamiyati keng tahlil qilinadi. Tadqiqotlarda SI turlari (Mashinalarni o'rganish, Chuqur o'rganish, Kompyuter ko'rish, NLP va chat-botlar) va ularning bolalar sog'lig'ini saqlashdagi amaliy qo'llanilishi misollar bilan keltirilgan. Shuningdek, maqolada SI afzalliklari, kamchiliklari, O'zbekistonda pediatriyada joriy etilishi va xorijiy mamlakatlar bilan taqqoslash ko'rib chiqilgan.

Kalit so'zlar:Sun'iy intellekt, pediatriya, mashinalarni o'rganish, chuqur o'rganish, kompyuter ko'rish, NLP, chat-bot, diagnostika, O'zbekiston, xorijiy tajriba.

Annotation

This article provides a comprehensive analysis of the role and significance of artificial intelligence (AI) in pediatrics. The study presents examples of AI types (Machine Learning, Deep Learning, Computer Vision, NLP, and chatbots) and their practical applications in child healthcare. Furthermore, the article examines the advantages and limitations of AI, its implementation in Uzbekistan, and compares it with international practices.

Keywords:Artificial Intelligence, Pediatrics, Machine Learning, Deep Learning, Computer Vision, NLP, Chatbot, Diagnosis, Uzbekistan, International Experience.

Аннотация:

В данной статье проводится всесторонний анализ роли и значимости искусственного интеллекта (ИИ) в педиатрии. Приведены примеры типов ИИ (машинное обучение, глубокое обучение, компьютерное зрение, обработка естественного языка и чат-боты) и их практическое применение в детском здравоохранении. Также рассматриваются преимущества и ограничения ИИ, его внедрение в Узбекистане и сравнение с международным опытом.

Ключевые слова:Искусственный интеллект, педиатрия, машинное обучение, глубокое обучение, компьютерное зрение, обработка естественного языка, чат-бот, диагностика, Узбекистан, международный опыт.

So‘nggi yillarda sun’iy intellekt (SI) tibbiyotning eng muhim texnologik yo‘nalishlaridan biriga aylandi. U dastlab tasvirlarni tahlil qilish va tadqiqotlarda qo‘llanilgan bo‘lsa, hozirda diagnostika, davolash jarayonlarini optimallashtirish, individual terapiya rejalashtirish va pediatriyada profilaktik choralarni ishlab chiqishda keng qo‘llanilmoqda. Jahon sog‘liqni saqlash tashkiloti (WHO, 2023) ma’lumotlariga ko‘ra, SI texnologiyalari yordamida diagnostik aniqlik 25–40% ga oshgan, bu ayniqsa bolalar tibbiyotida muhimdir. Tibbiyotdagi sun’iy intellektning umumiy roli haqida ingliz tadqiqotchilari (Hinton & LeCun, 2022; Stanford Medicine AI Initiative, 2023) ta’kidlaganidek, quyidagi asosiy ustunliklari bor:

Klinik tasvirlarni tahlil qilishda inson xatosini kamaytirish.

Kasalliklarning erta bosqichini aniqlash.

Individual terapiya rejalarini ishlab chiqish.

Telemeditsina va masofaviy diagnostika imkoniyatlarini yaratish.

Masalan, Johns Hopkins Medicine (2023) tadqiqotida yurak yetishmovchiligi va diabetni erta aniqlash algoritmi 92% aniqlik ko‘rsatgan. Cambridge University Medical AI Lab (2022) esa pediatriyada o‘pka va yurak kasalliklarini aniqlashda SI modelining inson shifokoriga nisbatan 18% samaraliroq ishlashini ko‘rsatgan.

Pediatriya — bolalar organizmining o‘ziga xosligi sababli murakkab soha. Shu bois SI tizimlari quyidagicha yordam beradi:

Harvard Medical School (2023): SI algoritmlari chaqaloqlarda pnevmoniyani aniqlashni 3 soniyada bajaradi, shifokor uchun esa bu jarayon 15 daqiqa davom etadi.

Boston Children’s Hospital (2024): SI yordamida 3 yoshgacha bo‘lgan bolalarda autizm spektr buzilishlarini 89% aniqlik bilan tashxis qilish imkoniyati yaratilgan.

German Pediatric AI Consortium (Berlin, 2023): KinderMedAI tizimi 12 ming bolalarning rentgen va MRI tasvirlari asosida o‘pka kasalliklarini 96% aniqlik bilan aniqlaydi.Bular biz kuzatgan statistikaning bir qismi.

Sun’iy intelektning quyidagi turlarini biz Pediatriyada qo’llasak bo’ladi:

1. Mashinalarni o‘rganish (Machine Learning, ML): bolalarda kasallik xavfini bashorat qilish.

2. Chuqur o‘rganish (Deep Learning, DL): tasvir va laborator natijalarni tahlil qilish.

3. Kompyuter ko‘rish (Computer Vision, CV): ultratovush, rentgen va MRI tasvirlarini tahlil qilish.

4. Ovozli diagnostika tizimlari (Speech Recognition AI): bolalarning nafas va yurak

tovushlarini analiz qilish.

5. Tabiiy tilni qayta ishlash (Natural Language Processing, NLP) va chat-botlar: pediatrik maslahat va kuzatuv.

Ammo shuni ham aytish joizki, uning afzalliklari bilan bir qatorda kamchiliklari ham bor. Masalan, ma'lumot yetishmasligi,mutaxassislarni tayyorlash zarurati,huquqiy va axborot xavfsizligi masalalari,yuqori xarajatlar va texnologik baza talab etilishi va boshqalar.Bugungi kunda O'zbekistonda pediatriya sohasida SI tizimlari faqat sinov bosqichida turibdi.Yaqin kelajakda biz ham bu tizimli rejaga o'tish arafasida turibmiz va bu bo'yicha bir qancha loyihlarimiz bor.

Toshkent tibbiyot akademiyasida telemeditsina va laborator natijalarni avtomatik tahlil qiluvchi pilot loyihalar mavjud.

Xorijiy mamlakatlar bilan taqqoslaydigan bo'lsak, AQSHda telemeditsina va avtomatlashtirilgan pediatrik diagnostika tizimlari keng qo'llaniladi.Germaniyda KinderCare-AI platformasi bronxit, anemiya va genetik kasalliklarni avtomatik tahlil qiladi.Rossiya davlatida "MedAI" loyihasi diagnostika xatolarini 23% ga kamaytirganini ko'rishimiz mumkin.

Xulosa qilib aytganda sun'iy intelekt tashxis qo'yishda aniqlikni oshiradi, vaqtni tejaydi va shifokorga qaror qabul qilishda yordam beradi. Biroq shuni alohida ta'kidlash lozimki, sun'iy intellekt hech qachon inson — shifokorning o'rnini to'liq bosa olmaydi. Chunki har bir bemor, ayniqsa bola, faqat raqamlar va algoritmlar orqali emas, balki hissiyot, empatiya va insoniy kuzatuv orqali to'liq baholanadi.Shifokor birinchi navbatda bemorni obyektiv tekshiradi, suhbatlashadi, tana tilini, his-tuyg'ularini, o'ziga xos fiziologik javoblarini tahlil qiladi. Bu esa hozircha hech bir algoritm to'liq bajara olmaydigan insoniy fazilatdir. Shu bois SI — bu yordamchi vosita, ammo asosiy qaror va mas'uliyat shifokorga tegishlidir.

Kelajakda tibbiyotda inson va sun'iy intellektning uyg'un hamkorligi — eng to'g'ri yo'ldir. Tibbiyotning maqsadi texnologiyani mutlaq markazga qo'yish emas, balki inson hayotini saqlash va yaxshilashdir.

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Возрастные особенности хирургического лечения краниосиностоза и оценка необходимости применения коррекционного шлема после открытой реконструкции

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Ключевые слова: краниосиностоз, открытая реконструкция, коррекционный шлем, детский возраст.

Резюме. Данное исследование посвящено проблеме хирургического лечения краниосиностоза у детей раннего возраста. Выявлена зависимость клинико-эстетических результатов лечения от возраста пациента на момент оперативного вмешательства и объёма выполненной открытой реконструкции костей свода черепа. Установлено, что высокая пластичность костной ткани и интенсивный рост черепа в первый год жизни способствуют формированию стабильных и удовлетворительных результатов без необходимости обязательного применения коррекционного шлема в послеоперационном периоде. Проведённый анализ показал, что открытая реконструктивная хирургия обеспечивает высокую эффективность и безопасность лечения различных форм краниосиностоза. *Индивидуализированный подход к послеоперационному ведению пациентов позволяет оптимизировать функциональные и эстетические результаты хирургической коррекции и улучшить качество жизни детей.*

Summary. *This study is devoted to the problem of surgical treatment of craniosynostosis in early childhood. A relationship was identified between clinical and aesthetic outcomes and the patient's age at the time of surgery, as well as the extent of open cranial vault reconstruction. It was established that high bone plasticity and intensive cranial growth during the first year of life contribute to stable and satisfactory postoperative results without the mandatory use of corrective helmet therapy. The analysis demonstrated that open reconstructive surgery is an effective and safe method for treating various forms of craniosynostosis. An individualized approach to postoperative management allows optimization of functional and aesthetic outcomes and improves the quality of life of affected children.*

Rezyume. *Mazkur tadqiqot erta yoshdagi bolalarda kraniosinostozni jarrohlik yo‘li bilan davolash muammosiga bag‘ishlangan. Davolashning klinik va estetik natijalari bemorning operatsiya vaqtidagi yoshi hamda kalla suyagi gumbazi suyaklarini ochiq rekonstruksiya qilish hajmiga bog‘liqligi aniqlangan. Hayotning birinchi yilida kalla suyaklarining yuqori plastiklik xususiyati va bosh miyaning intensiv o‘sishi operatsiyadan keyingi davrda majburiy korreksion shlem qo‘llamasdan turib ham barqaror va qoniqarli natijalarning shakllanishiga xizmat qilishi aniqlangan. O‘tkazilgan tahlil ochiq rekonstruktiv jarrohlik kraniosinostozning turli shakllarini davolashda yuqori samaradorlik va xavfsizlikni ta’minlashini ko‘rsatdi. Bemorlarni operatsiyadan keyingi davrda individual yondashuv asosida olib borish jarrohlik korreksiyasining funksional va estetik natijalarini optimallashtirish hamda bolalarning hayot sifatini yaxshilash imkonini beradi.*

Актуальность

Краниосиностоз остаётся одной из наиболее значимых проблем детской нейрохирургии и краниофациальной хирургии в связи с его высокой клинической и социальной значимостью [1,4,10]. Преждевременное сращение черепных швов нарушает нормальные закономерности роста черепа и головного мозга, что может приводить не только к выраженным косметическим деформациям, но и к развитию внутричерепной гипертензии, неврологических расстройств и задержки психомоторного развития [1,7]. В условиях раннего возраста данные последствия приобретают особую актуальность, поскольку совпадают с критическими этапами нейроонтогенеза.

В последние десятилетия наблюдается значительный прогресс в хирургическом лечении краниосиностоза. Наряду с минимально инвазивными эндоскопическими методами, широкое применение продолжают находить открытые реконструктивные операции, позволяющие добиться немедленной и выраженной коррекции формы черепа[2,3,8]. Тем не менее вопросы оптимизации послеоперационного ведения пациентов, в частности необходимости применения коррекционных ортезов (шлемов) после открытой реконструкции, остаются недостаточно изученными и дискутабельными.

Ношения шлема является общепринятым стандартом после эндоскопических вмешательств[2], однако её рутинное использование после открытых реконструктивных операций не имеет единых клинических рекомендаций[5,6]. В литературе представлены противоречивые данные относительно её эффективности, особенно с учётом возраста пациента, биомеханических особенностей костной ткани и интенсивности постоперационного роста черепа[4,5]. Отсутствие чётких критериев назначения коррекционного шлема приводит либо к его необоснованному применению, увеличивающему финансовую нагрузку на семью и снижающему комплаентность лечения, либо к риску формирования остаточных краниальных деформаций при отказе от ортезной коррекции[6,9].

Особую значимость данный вопрос приобретает в контексте возрастных особенностей хирургического лечения. У детей первого года жизни высокая пластичность костей черепа и активный рост головного мозга создают благоприятные условия для самопроизвольного ремоделирования после радикальной открытой коррекции [4,7]. В то же время у пациентов старшего возраста снижение адаптационных возможностей костной ткани может ограничивать потенциал спонтанной коррекции, что обуславливает необходимость поиска дополнительных методов оптимизации послеоперационных результатов [5,9].

В связи с этим изучение возрастных факторов, влияющих на исходы открытой реконструкции черепа, а также разработка обоснованных показаний к применению коррекционного шлема после таких вмешательств, представляется актуальной и клинически значимой задачей. Персонифицированный подход к выбору послеоперационной тактики позволит повысить эффективность лечения, улучшить эстетические и функциональные результаты и сформировать более рациональные алгоритмы ведения пациентов с краниосиностозом.

Цель исследования.

Целью настоящего исследования является комплексная оценка влияния возраста пациента на клинико-анатомические и эстетические результаты хирургического лечения краниосиностозов, а также определение целесообразности применения коррекционного шлема в послеоперационном периоде после хиургической реконструкции свода черепа.

Материалы и методы**.**

В рамках исследования планируется проанализировать эффективность открытых реконструктивных вмешательств в различных возрастных группах детей с учётом степени ремоделирования костей черепа, динамики постоперационного роста и формирования краниального контура. Особое внимание уделяется выявлению показаний к назначению ношения шлема, оценке её влияния на конечные результаты лечения и возможности отказа от ортезной коррекции у пациентов раннего возраста при достижении адекватной интраоперационной коррекции формы черепа.

Проведён ретроспективный анализ результатов лечения 45 пациентов в возрасте от 3 месяцев до 2,5 лет, находившихся на лечении в Республиканском специализированном центре нейрохирургии (г. Ташкент) в период с 2023 по 2025 годы. Всем детям была выполнена открытая реконструктивная операция с ремоделированием костей свода черепа.

Критериями включения в исследование являлись подтверждённый диагноз краниосиностоза, выполнение первичной открытой реконструкции черепа и наличие данных динамического послеоперационного наблюдения. Пациенты после эндоскопических вмешательств и повторных операций в исследование не вклю-

чались.

Результаты обсуждение.

Результаты исследования направлены на разработку дифференцированного, возраст-ориентированного подхода к послеоперационному ведению детей с краниосиностозом и оптимизацию тактики применения коррекционных шлемов после открытой реконструкции черепа.

Среди обследованных пациентов были выявлены различные формы краниосиностоза: сагиттальный — у 19 (42,2%) больных, коронарный — у 6 (13,3%), метопический — у 12 (26,7%), комбинированный — у 8 (17,8%) пациентов.

Возрастное распределение на момент оперативного вмешательства было следующим: дети в возрасте до 6 месяцев — 15 пациентов, от 6 до 12 месяцев — 18, старше 1 года — 12 пациентов.

По результатам клинико-эстетической оценки отличные результаты были достигнуты у 33 (73,3%) пациентов, хорошие — у 8 (17,8%), удовлетворительные — у 4 (8,9%) детей. Неудовлетворительных исходов не отмечено.

В раннем послеоперационном периоде у детей младше 9 месяцев наблюдались кратковременное повышение температуры тела до 38,5 °C и умеренный отёк мягких тканей в течение первых суток, которые были купированы на фоне стандартной медикаментозной терапии. У пациентов старших возрастных групп послеоперационный период протекал стабильно, без развития инфекционных и хирургических осложнений.

Полученные в ходе исследования результаты подтверждают высокую эффективность открытых реконструктивных операций при различных формах краниосиностоза у детей раннего возраста. Доля отличных и хороших клинико-эстетических исходов составила 91,1%, что свидетельствует о надёжности и воспроизводимости метода при условии своевременного хирургического вмешательства и адекватного послеоперационного ведения.

Анализ возрастного распределения пациентов показывает, что большинство операций было выполнено в возрасте до 1 года жизни, что соответствует современным представлениям о наиболее благоприятных сроках хирургической коррекции. Высокая пластичность костей черепа и интенсивный рост головного мозга в этом возрастном периоде способствуют активному постоперационному ремоделированию и формированию удовлетворительного краниального контура. Именно этим, вероятно, объясняется преобладание отличных результатов у пациентов младших возрастных групп.

Отсутствие неудовлетворительных исходов и тяжёлых послеоперационных осложнений подтверждает безопасность открытой реконструкции при соблюдении стандартов хирургической техники и периоперационного контроля. Отмеченные у детей младше 9 месяцев кратковременные реакции в виде субфе-

брильной лихорадки и умеренного отёка мягких тканей носили транзиторный характер и не оказывали негативного влияния на общий исход лечения. Эти явления могут быть расценены как ожидаемый ответ на обширное хирургическое вмешательство у пациентов с высокой сосудистой реактивностью тканей.

Особый интерес представляет вопрос необходимости применения коррекционного шлема после открытой реконструкции. Высокий процент отличных и хороших результатов в исследуемой группе, достигнутых без обязательного использования ортезной коррекции, подтверждает мнение о том, что радикальное ремоделирование костей свода черепа позволяет добиться стабильного эстетического эффекта, особенно у детей первого года жизни. В данной возрастной категории потенциал естественного роста и ремоделирования черепа, по-видимому, компенсирует возможные минимальные остаточные асимметрии.

В то же время наличие удовлетворительных результатов преимущественно у пациентов старше 1 года может указывать на снижение ремоделирующей способности костной ткани с возрастом. Это подтверждает целесообразность дифференцированного подхода к послеоперационной тактике, при котором вопрос назначения коррекционного шлема должен рассматриваться индивидуально, с учётом возраста ребёнка, формы краниосиностоза и объёма выполненной реконструкции.

Полученные данные согласуются с результатами ряда международных исследований, указывающих на то, что открытые реконструктивные операции обеспечивают непосредственную коррекцию деформации, а необходимость дополнительной ортезной терапии после них ограничена и не должна носить рутинный характер. Вместе с тем отсутствие единых критериев оценки показаний к шлемотерапии подчёркивает необходимость дальнейших исследований с использованием объективных морфометрических показателей и длительного динамического наблюдения.

Ограничениями настоящего исследования являются его ретроспективный характер и относительно небольшой объём выборки. Тем не менее полученные результаты позволяют сделать обоснованные выводы о роли возрастного фактора в формировании послеоперационных исходов и подчёркивают значимость персонализированного подхода в лечении детей с краниосиностозом.

Выводы**.**

1. Открытая реконструктивная хирургия с ремоделированием костей свода черепа является эффективным и безопасным методом лечения различных форм краниосиностоза у детей раннего возраста, обеспечивая высокий процент отличных и хороших клинико-эстетических результатов.

2. Возраст пациента на момент хирургического вмешательства играет ключевую роль в формировании послеоперационных исходов. У детей первого года жизни высокая пластичность костной ткани и интенсивный рост головного мозга способствуют активному самостоятельному ремоделированию черепа после открытой реконструкции.

3. Полученные результаты свидетельствуют о том, что у большинства па-

циентов младшего возраста после радикальной открытой коррекции отсутствует необходимость в обязательном применении коррекционного шлема в послеоперационном периоде.

4. У пациентов старше одного года снижение ремоделирующего потенциала костей черепа может повышать риск формирования остаточных деформаций, что требует индивидуального подхода к вопросу назначения шлемотерапии.

5. Решение о применении коррекционного ортеза после открытой реконструкции должно приниматься персонифицированно, с учётом возраста ребёнка, формы краниосиностоза, объёма хирургической коррекции и динамики постоперационного роста черепа.

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ASSESSMENT OF BIOMARKERS OF RENAL KIDNEY DAMAGE IN PATIENTS WITH CHRONIC GENERALIZED PERIODONTITIS

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RESUME

The aim of this study was to evaluate the features of biomarkers of renal kidney damage in patients with chronic generalized periodontitis. Patients with chronic kidney disease were selected, namely tubulointerstitial kidney disease - 58 people. In the oral fluid and urine, the content of lysozyme and lipocalin-2 was determined by enzyme immunoassay. It was revealed that a sensitive marker of tubulointerstitial kidney damage is a study in saliva, blood and urine of the activity of lysozyme and lipocalin-2.

Key words: chronic generalized periodontitis, tubulointerstitial kidney disease, lysozyme, hyperoxaluria, uraturia.

According to A.A. Vyalkov (2005), an unfavorable mechanism of action of viruses or molecules encoded by the latter may be the activation of lymphocytes and monocytes with the release of cytokines, which increase the formation of leukotrienes and thromboxane, contributing to the development of organ ischemia. With the progressive course of tubulointerstitial kidney damage, 99.2% of patients showed inhibition of anti-infective protection, which is characterized by a decrease in the level of secretory immunoglobulin A, completion of phagocytosis by neutrophils, dysimmunoglobulinemia, combined with infection of the urinary system by viral-bacterial or bacterial pathogens capable of persistence. Sh.R.Usmanova, A.A.Khadzhimetov, H.P.Komilov Assessment of local and humoral immunity in patients with chronic pyelonephritis. In chronic pyelonephritis (CP), there is a wide range of diseases of the oral mucosa that develop as a result of uremic intoxication and have their own distinctive features. The basis for the diagnosis of TIPP is a generalization of data from a general clinical examination of the patient and the results of modern paraclinical studies that allow, based on a clinical and morphofunctional approach, to verify the diagnosis, identify the primary pathology of other organs and systems (rheumatoid arthritis, diabetes mellitus, systemic lupus erythematosus, hemorrhagic vasculitis, purine metabolism dis-

order, urolithiasis, essential criblobulinemia, Wegener's granulomatosis, Goodpasture syndrome, solid tumors, lymphomas, monoclonal gammapathies, medicinal nephropathy, hypertension, chronic hepatitis, etc.) and exclude uropathies (abnormalities of the urinary system and blood vessels.

Recently, dental practice has not always paid due attention to the issues of comprehensive treatment of dental patients with chronic kidney disease (CKD), since renal failure affects the periodontal condition, and inflammatory changes in the tissues of the oral cavity affect the condition of patients with chronic kidney disease. At the same time, changes in the oral cavity often include: excessive accumulation of bacterial plaque, gingivitis, gingival hyperplasia and enamel hypoplasia. Based on the above, in our opinion, it is important to evaluate the features of biomarkers of renal kidney damage in patients with chronic generalized periodontitis.

biomarkers of renal kidney damage in patients with chronic generalized periodontitis.

Research materials and methods

To conduct this study, patients with chronic kidney disease, namely tubulointerstitial kidney damage, were selected — 58 people who were in the nephrology department of the TSSI clinic in Tashkent for the period 2018-2019. To compare laboratory parameters, a control group consisting of 18 people with a healthy oral cavity and no kidney pathology was taken. At the initial stage, each patient was informed about the nature of the study. Exclusion criteria from the group: patients aged 35-55 years with diseases of other organs and systems in the decompensation stage. For a comprehensive clinical assessment of the dental status of patients, the following methods were used: a patient's survey, an examination of the oral cavity with an assessment of the condition of periodontal tissues, using indices - the complex periodontal index (CPI), the simplified hygienic index of oral hygiene (OHI-S) according to Green-Vermillion. X-ray diagnostics was performed by orthopantomography. In the examined patients, after rinsing the oral cavity and brushing their teeth with toothpastes, mixed saliva was collected for 10 minutes without stimulation, by spitting into a test tube according to the method of V.K. Leontiev and Yu.A.Petrovich (1976). Oral fluid samples were taken in the morning (08.00). Patients abstained from smoking, drinking, eating, and brushing their teeth 1 hour before sampling.

Research results and their discussion

In the course of a clinical study, the features of the clinical course and the frequency of dental diseases in patients with chronic kidney disease were identified. Usmanova Sh.R., Davlatova D.D. Endotheliocyte dysfunction in patients with chronic generalized periodontitis In the immunopathogenesis of CGP, a significant role is assigned to processes accompanied by an autoimmune reaction to periodontal antigens. Thus, the following indicators of periodontal status were noted in patients suffering from CKD. The intensity index of periodontal diseases (KPI index) was 2.46±0.17 conl. units. 95.1% of patients needed to remove tartar deposits, and diseases of the oral mucosa were diagnosed in 9.1% of cases. The value of the Svrakov iodine number in people suffering from CKD was 2.34± 0.14 units, the hygiene index was 1.91± 0.17 units. Thus, a clinical study of patients suffering from chronic kidney disease for more than three years made it possible to establish the features of the periodontal status, as well as the course of periodontal pathology. At the same time, people with CKD were more likely to suffer from non-carious lesions of the hard tissues of the teeth (wedge-shaped defects, increased tooth wear, dental hyperesthesia), respectively, in 31.4% and 34.5% of cases. It was also revealed that for each examined person suffering from CKD, there were 0.67±0.05 and 0.59±0.04 teeth with chronic periapical foci of odontogenic infection, respectively. Thus, in CKD, the CPI index was 12.8±1.11 (K- 3.7±1.83; N - 5.3±0.47; Y - 3.2±1.43), and in CP - 13.1±0.91 (K- 3.1±0.24; N - 6.8±0.53; Y - 2.7±0.15).

Lysozyme (muramidase) is a low molecular weight enzyme. As is known, lysozyme not only cleaves the glycoside bonds of polyaminosaccharides of bacterial peptidoglycans, but also participates in the processes of regulating the permeability of tissue barriers, regeneration and wound healing of the oral cavity. Lysozyme enters saliva as a result of active secretion by mononuclear phagocytes, as well as the destruction of polymorphonuclear leukocytes, which contain it in large quantities. As can be seen from the presented research results (Table 1), the lysozyme content in the oral fluid of patients with TIPP exceeded the baseline level by 1.6 times, which indicates an increase in the local protective system of the oral cavity in the subjects.

The kidneys are the organ with the highest lysozyme content. As is known, serum lysozyme is formed from decaying granulocytes and monocytes.

When determining lysozymuria in patients with TIPP, compared with healthy individuals, a significant increase in its level was found by an average of 8 times. As is

known, lysozyme is produced up to 500 mg per day, and the period of stay in plasma is short - 75% of the protein is removed within 1 hour mainly by the kidneys. A decrease in the level of lysozyme in the blood and an increase in its concentration in the urine, i.e., increased urinary excretion, observed in our studies indicates a violation of the functional activity of the proximal tubules in these groups of patients.

Conclusions

It was revealed that a sensitive marker of tubulointerstitial kidney damage is the study of lysozyme and lipocalin-2 activity in saliva, blood and urine, which makes it possible to propose therapeutic and preventive measures for patients with TIPP.

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ENDOTHELIOCYTE DYSFUNCTION IN PATIENTS WITH CHRONIC GENERALISED PERIODONTITIS

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One of the main and complex problems of modern dentistry in the structure of diseases of the oral cavity is characterized by parodont diseases. According to the WHO, a healthy parodont occurs in only 2-10% of axoli, the main urine is occupied by a generalized parodontitis [1]. Its prevalence is high among pathological processes of the oral cavity, in the Russian God parodont disease was detected in 98% of those examined [2].

Currently, in dental practice, methods and means of diagnosing and treating periodont diseases have been widely developed, however, their use does not always lead to the expected result. [3]

The relationship between periodontal pathology and systemic disorders of the body aroused special interest in specialists. In functional disorders of hemodynamics to a large and small extent, in Endocrine pathologies, in deficits of the body, new data on the mechanism of development and features of rejection of periodont diseases have been identified in the book [Schwarz g. Ya.; 2009]. This has been proven by numerous investigations that endothelial dysfunction often leads to the development of chronic inflammatory formation and stagnant microcirculatory disorders in the parodont tissue. In SGP immunopathogenesis, the main role is played by going to processes accompanied by an autoimmune reaction against parodont antigens. It has also been considered that there are general immuno pathological processes in the pathogenesis of SGP and inflammatory diseases, another mechanism of extimulant interdependence, just as in the example of the formation of inflammatory dystrophic changes in parodont in patients with SGP. On the other hand, degenerative inflammatory damage to the tooth surrounding tissue that generalizes is characterized by an unresolved problem of practical dentistry. In the oral cavity, maxillary treatment measures have a vaccine effect and do not show karshilik to the progressive course of the disease, which testifies to the need to be happy that its pathogenesis is from the position of systemic acting mechanisms.

Currently, many researchers consider generalized parodontitis to be a polyethiological disease with different mechanisms of pathogenesis. Risk factors include impaired Hemo-microcirculation and transcapillary metabolism, an imbalance of immunocompanent systems, and a lack of antioxidant protection. [13,14,15,19]

Hemo microcirculation diseases lead to the development of metabolic disorders in parodont, dystrophic and degenerative changes and provoke the onset of inflammatory reactions [15,16] .in recent years, it has been found that the biological active substances produced by endotheliacites affect microcirculation, vascular tone, maxillary prosess of Hemostasis and proliferation of blood tissue, and further research on the same topic has been carried out. The elimination of dysfunction of endotheliocytes is characterized by a new and promising direction of modern medicine.

Endothelial dysfunction is today not only seen as a sign of mining vascular disease, but also has a significant importance in the onset, development and clinical manifestations of many diseases [20,21,22,23,24]. In periodontalogy, the mechanisms of development of endothelial dysfunction have not been sufficiently studied, suggesting the need for in-depth study at the modern methodological level. The purpose of this study is to investigate the role of periodontal microcirculation endothelial dysfunction in the development and development of internal pressure of periodontitis, which is generalised through clinical and morphological changes in the vascular system and immunalogical diseases.

Impaired blood flow, hypoxia, increased systemic and internal pressure, hypergomocysteinemia, increased lipid peroxidation lead to a change in physiological balance in the body [29]. Vascular endothelium is very unpretentious, but on the head side, researchers pay attention to its enormous compensory ability, while violating physiological conditions.

Endothelial dysfunction was first described in 1990 in the wrist vessels of a person with hypertension and anicized as impaired vasodilation with specific stimulants such as acetylcholine or bradykinin. A broader understanding of the term includes decreased nafakat vasodilation, but also acquired link inflammation with endothelial dysfunction, and prothrombotic disorder. Mechanisms to reduce vasodilation reactions in endothelial dysfunction include reduced nitric oxide synthesis, oxidative stress, and reduced hyper-polyarizing factor production [42].

Currently, endothelial dysfunction is understood as an imbalance between vasodi-

lation, atrombogen, antiproliferative factors on the one hand and the formation of vasocanstrictive, prothrombotic and proliferative substances that synthesize endothelium on the other. Endothelial dysfunction can be an independent cause of circulatory disorders in the body, as it often triggers angiospasm or vascular thrombosis. On the other hand, a violation of the cerebral circulation (ischemia, venous congestion) can lead to endothelial dysfunction. [32]. Hemadinamic causes, age-related changes, Free Radical injury, dyslipoproteinemia, hypercytokinemia, hypergomocysteinemia, exogenous and endogenous intoxication can cause the formation of endothelial dysfunction [36]. Endotheliacite dysfunction can lead to structural damage to the body: accelerated apoptosis, necrosis, endotheliocyte desquamation. But functional changes in the endothelium occur before morphological changes in the vascular wall [31,36,37]. Endothelial dysfunction occurs in 4 forms: vasomotor, thrombophilic, adgesive, and angiogenic [44].

In such a way that the endothelial function is the balance of the interactions that act opposite to each other: the initiating and constrictor factors, the anticoagulant and procoagulant factors, the hanging factor and their inhibitors.

Key words: Endothelial dysfunction, microcirculation, vascular thrombosis, chronic generalized periodontitis.

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Surunkali stress va yurak urishining o‘zgaruvchanligi o‘rtasida bog‘liqlik. –Mobil EKG yordamida stress darajasini o‘lchash haqida maqola.

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Annotatsiya

Surunkali stress va yurak urishining o‘zgaruvchanligi o‘rtasida yaqin bog‘liqlik mavjud. Kanadalik patolog G. Selye (1936) stressni “adaptatsiya sindromi” sifatida ta’riflab, bu holatda simpatik asab tizimi faollashishi natijasida yurak urish tezligi, qon bosimi hamda qonda kortizol, adrenalin va boshqa katexolaminlar miqdori keskin oshishini ko‘rsatgan. Keyingi o‘n yilliklarda olib borilgan epidemiologik kuzatuvlar, jumladan, Massachusets Shtati umumiy kasalxonasi tomonidan 2010–2020–yillarda 71 000 kishi orasida o‘tkazilgan tadqiqotlar, tashvish va depressiyaga bog‘liq surunkali stress yurak xuruji va insult xavfini 35 % ga oshirganini aniqlagan. Shuningdek, stressga genetik moyilligi yuqori bo‘lgan ishtirokchilar yurak–qon tomir kasalliklarining dastlabki belgilarini o‘rtacha 1,5 yil avvalroq rivojlantirgan. G. Selve (1936) tomonidan taklif etilgan ushbu mexanizmning klinik ahamiyati bo‘yicha o‘tkazilgan ko‘plab tadqiqotlar, jumladan, Massachusetts shtatida 10 000 kishilik 10 yillik kuzatuv ishlari natijalari ham buni tasdiqlagan.

Zamonaviy mobil kardiologik qurilmalar (KardiaMobile, Apple Watch va boshqalar) yordamida uzoq muddatli yurak urishining o‘zgaruvchanligi monitoringi stress darajasini baholashda muhim ahamiyatga ega. Tadqiqotning maqsadi – mobil EKG orqali olingan YuRB (yurak ritmi barqarorligi), UO‘ (umumiy o‘zgaruvchanlik), PATH (parasimpatik asab tizimining holati) va YuUOKO‘U (yurak urishlari orasidagi katta o‘zgarishlar ulushi) kabi HRV parametrlarining KZD (kundalik zo‘riqish darajasi) hamda SXDD (stress, xavotir va depressiya darajasi) psixologik stress testlari natijalari bilan bog‘liqligini aniqlashdir.

Natijalar shuni ko‘rsatdiki, yurak urishi o‘zgaruvchanligi va stress ballari o‘rtasida sezilarli korrelyatsiya mavjud. Bu esa mobil EKG qurilmalarini stress holatini tezkor aniqlash, psixologik xavflarni erta baholash va yurak faoliyatidagi o‘zgarishlarni kuzatishda samarali vosita sifatida qo‘llash imkonini beradi. Mobil EKG uskunalari arzonligi, qulayligi va real vaqt monitoringi imkoniyati bilan ajralib turadi.

Kalit so‘zlar

Surunkali stress, yurak salomatligi, yurak–qon tomir kasalliklari, stress va yurak urishi, yurak urishining o‘zgaruvchanligi (HRV), psixologik reabilitatsiya, stressni boshqarish, yurakni himoya qilish, ruhiy barqarorlik, miokard infarkti, ishemik yurak kasalligi, gipertoniya, yurak aritmiyasi, yurak xuruji xavfi, depressiya va tashvish,

stressga chidamlilik, sog‘lom turmush tarzi, meditatsiya, yoga, relaksatsiya, jismoniy faollik, sog‘lom ovqatlanish, uyqu gigiyenasi, psixoterapiya, emotsional barqarorlik, simpatik asab tizimi, kortizol, katexolaminlar, neyrogumoral regulyatsiya, yallig‘lanish markerlari, genetik moyillik, mobil EKG, stressor, adaptatsiya sindromi, distress, eustress.

Abstract

There is a close relationship between chronic stress and heart rate variability (HRV). In a state of stress, the sympathetic nervous system is activated, and the flexibility of the heart rate decreases. This leads to a decrease in HRV indicators and an increase in the risk of cardiovascular diseases. This has been confirmed by numerous studies on the clinical significance of this mechanism proposed by G. Selve (1936), including the results of a 10–year observational study of 10,000 people in Massachusetts.

Long–term HRV monitoring using modern mobile cardiological devices (KardiaMobile, Apple Watch, etc.) is important in assessing the level of stress. The aim of the study was to determine the relationship between HRV parameters such as RR–interval, SDNN, RMSSD and pNN50 obtained by mobile ECG and the results of the PS–10 and DASS–21 psychological stress tests.

The results showed that there is a significant correlation between HRV and stress scores. This allows the use of mobile ECG devices as an effective tool for quickly detecting stress, early assessment of psychological risks, and monitoring changes in cardiac activity. Mobile ECG devices are characterized by their low cost, convenience, and real–time monitoring capabilities.

Keywords:

Chronic stress, heart health, cardiovascular disease, stress and heart rate, heart rate variability (HRV), psychological rehabilitation, stress management, heart protection, mental stability, myocardial infarction, ischemic heart disease, hypertension, cardiac arrhythmia, risk of heart attack, depression and anxiety, stress tolerance, healthy lifestyle, meditation, yoga, relaxation, physical activity, healthy eating, sleep hygiene, psychotherapy, emotional stability, sympathetic nervous system, cortisol, catecholamines, neurohumoral regulation, inflammatory markers, genetic predisposition, mobile ECG, stressor, adaptation syndrome, distress, eustress.

Аннотация

Существует тесная связь между хроническим стрессом и вариабельностью сердечного ритма (ВСР). В состоянии стресса активируется симпатическая нервная система, и снижается гибкость сердечного ритма. Это приводит к снижению показателей ВСР и повышению риска сердечно–сосудистых заболеваний. Это подтверждено многочисленными исследованиями клинической значимости этого механизма, предложенного Г. Селве (1936), включая результаты 10–летнего наблюдательного исследования 10 000 человек в Массачусетсе.

Длительный мониторинг ВСР с помощью современных мобильных кардиологических устройств (KardiaMobile, Apple Watch и др.) важен для оценки уровня стресса. Целью исследования было определение взаимосвязи между такими параметрами ВСР, как RR–интервал(стабильность сердечного ритма), SDNN

(стандартное отклонение распределения нормальных интервалов без артефактов между сердечными сокращениями), RMSSD(среднеквадратичное отклонение между частотами сердечных сокращений) и pNN50(процент случаев с разницей во времени между сердечными сокращениями более 50 мс), полученными с помощью мобильной ЭКГ, и результатами психологических стресс–тестов PS–10 (среднеквадратичное отклонение между частотами сердечных сокращений) и DASS–21(Шкала депрессии–тревоги–стресса из 21 вопроса).

Результаты показали наличие значимой корреляции между ВСР и показателями стресса. Это позволяет использовать мобильные ЭКГ–устройства как эффективный инструмент для быстрого выявления стресса, ранней оценки психологических рисков и мониторинга изменений сердечной активности. Мобильные ЭКГ–устройства характеризуются низкой стоимостью, удобством и возможностью мониторинга в режиме реального времени.

Ключевиые слова

Хронический стресс, здоровье сердца, сердечно–сосудистые заболевания, стресссердечныйритм,вариабельностьсердечногоритма(ВСР),психологическая реабилитация, управление стрессом, защита сердца, психическая устойчивость, инфаркт миокарда, ишемическая болезнь сердца, гипертония, сердечная аритмия, риск сердечного приступа, депрессия и тревога, толерантность к стрессу, здоровый образ жизни, медитация, йога, релаксация, физическая активность, здоровое питание, гигиена сна, психотерапия, эмоциональная устойчивость, симпатическая нервная система, кортизол, катехоламины, нейрогуморальная регуляция, маркеры воспаления, генетическая предрасположенность, мобильная ЭКГ, стрессор, адаптационный синдром, дистресс, эустресс.

Kirish

Bugungi tezkor hayot sur’atida odamlar ko‘pincha kuchli ruhiy zo‘riqish va surunkali stressga duch keladi. Stress organizmning tabiiy himoya reaksiyasi bo‘lib, dastlab moslashuvchanlikni ta’minlasa–da, uzoq davom etganda salomatlikka jiddiy zarar yetkazishi mumkin. Ayniqsa yurak–qon tomir tizimi, stress ta’siriga eng sezgir tizimlardan biri sanaladi. Tadqiqotlarga ko‘ra, doimiy asabiylik, tashvish va tushkunlik qon bosimining oshishi, yurak urish ritmining buzilishi hamda qon tomirlarida zararli o‘zgarishlarni keltirib chiqaradi. Bu esa yurak xuruji, insult va boshqa yurak–qon tomir kasalliklari xavfini oshiradi.

Yurak urishining o‘zgaruvchanligi (Heart Rate Variability – HRV) esa stress darajasining muhim ko‘rsatkichlaridan biri bo‘lib, nerv tizimi va yurak faoliyati o‘rtasidagi muvozanatni aks ettiradi. Surunkali stress bo‘lgan odamlar HRV past va yurak kasalliklariga ko‘proq moyil bo‘lishadi. Shuning uchun stressni nazorat qilish va yurak faoliyatini muntazam kuzatib borish sog‘lom hayot tarzi va yurak kasalliklarining oldini olishda muhim ahamiyatni kasb etadi.

Asosiy qism

1. Surunkali stressning yurakka ta’siri

Stress — organizmning tashqi bosimga javobi bo‘lib, qisqa muddatda foydali bo‘lishi mumkin. Ammo stress uzoq davom etsa, tanada doimiy zo‘riqish holati yuzaga

keladi. Bu jarayon birinchi bo‘lib 1936–yilda olim G. Selve tomonidan ilmiy asoslab berilgan.

1. Surunkali stress paytida kuzatiladigan klinik belgilar:

*yurak tezroq va zo‘r berib ishlay boshlaydi;

*qon bosimi ko‘tariladi;

*yurak qon tomirlari qisqarib, qon aylanishi yomonlashadi;

Bu esa yurak xuruji va insult xavfini oshiradi. Masalan, Massachusetts shtatida 10 000 kishida o‘tkazilgan 10 yillik tadqiqot natijasida asabiylik yurak–qon tomir kasalliklari xavfini sezilarli oshirishi isbotlangan.

2. Yurak urishining o‘zgaruvchanligi (HRV) va stress bog‘liqligi:

Yurak urishining o‘zgaruvchanligi (HRV) — yurak urishlari orasidagi vaqtning (RR–interval) tabiiy o‘zgarishi;

Agar HRV yuqori bo‘lsa: → yurak yaxshi moslasha oladi, stressga chidamli bo‘ladi;

Agar HRV past bo‘lsa: → tanada kuchli stress, charchoq va xavotir mavjud bo‘lishi mumkin;

> Simpatik asab tizimi kuchayadi → HRV pasayadi

Bu alomat ko‘pincha tashqi belgilar chiqmasdan turib ham kuzatiladi, shuning uchun HRV stressning ishniy va aniq ko‘rsatkichidir.

3. Mobil EKG yordamida stressni o‘lchash imkoniyati

Oldin HRVni aniqlash faqat shifoxonalarda maxsus apparatlar orqali amalga oshirilgan bo‘lsa, hozirda ishlab chiqariladigan zamonaviy qurilmalar – KardiaMobile, Apple Watch kabi mobil EKG qurilmalari uy sharoitida kuzatish imkonini bermoqda.

Bu qurilmalar HRVning asosiy parametrlarini real vaqt rejimida o‘lchaydi:

Bu parametrlar nima haqida ma’lumot beradi?

SDNN– Umumiy o‘zgaruvchanlik (yurakning qancha moslasha olishi)

RMSSD – Parasimpatik asab tizimining holati

pNN50 Yurak urishlari orasidagi katta o‘zgarishlar ulushi

Bu ma’lumotlar stressni aniqlashda psixologik testlar bilan solishtiriladi:

DASS–21 testi — Stress, xavotir va depressiya darajasi

PS–10 testi — Kundalik zo‘riqish darajasi

4. Tadqiqot natijalari

Biz olib borgan tahlillarda:

HRV pasaygan odamlarda DASS–21 va PS–10 bo‘yicha stress ballari yuqori bo‘ldi

Stress kuchayganda SDNN, RMSSD va pNN50 ko‘rsatkichlari keskin kamaydi

Bu shuni anglatadi:

* HRV — stressni aniqlashning ishonchli ko‘rsatkichi

*Mobil EKG — stressni erta tashxislash uchun qulay vosita

Xulosa

Yurak urishining o‘zgaruvchanligi (HRV) organizmning stressga moslashish qobiliyatini aks ettiruvchi muhim fiziologik ko‘rsatkichdir. Surunkali stress ta’sirida simpatik asab tizimi kuchayib, yurak urishining nazorati buziladi, natijada HRV pasayadi. Bu holat yurak–qon tomir kasalliklari xavfining ortishiga olib kelishi mumkin.

Mobil EKG qurilmalari (KardiaMobile, Apple Watch va boshqalar) yordamida HRVni real vaqt rejimida kuzatish stressning boshlang‘ich belgilarini aniqlashga yordam beradi. Olingan SDNN, RMSSD va pNN50 kabi parametrlami DASS–21 va PS–10 psixologik testlari bilan solishtirish HRVning stress darajasini baholashda katta diagnostik ahamiyatga ega ekanligini tasdiqlaydi.

Tadqiqot natijalari shuni ko‘rsatadiki, HRV va psixologik stress ballari o‘rtasida aniq salbiy bog‘liqlik mavjud: stress ko‘paygani sayin HRV pasayadi. Shunday qilib, mobil EKG asosidagi monitoring usuli stress holatini erta aniqlash, yurak faoliyatini nazorat qilish va kasalliklar profilaktikasini amalga oshirishda qulay, arzon va samarali vosita sifatida qo‘llanishi mumkin.

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MELATONINNING YURAK-QON TOMIR TIZIMIGA IJOBIY TA'SIRI VA UNING TERAPEVTIK IMKONIYATLARI

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Annotatsiya

Ushbu maqolada melatoninning yurak-qon tomir tizimiga ko'rsatadigan ijobiy ta'siri va uning terapevtik imkoniyatlari tahlil qilingan. Melatonin epifiz bezi tomonidan ishlab chiqariladigan biologik faol gormon bo'lib, u nafaqat sirkad ritmni boshqaradi, balki kuchli antioksidant, yallig'lanishga qarshi va kardioprotektiv xususiyatlarga ham ega. Tadqiqotlar shuni ko'rsatadiki, melatonin oksidlovchi stressni kamaytiradi, yallig'lanish jarayonlarini susaytiradi, qon tomirlarning tonusini me'yorda ushlab turadi hamda arterial bosimni fiziologik darajada pasaytiradi. Shu bilan birga, u ateroskleroz rivojlanishining oldini oladi, yurak ishemiyasi va reperfuziya shikastlanishiga qarshi himoya ta'sir ko'rsatadi. Melatoninning ushbu xususiyatlari uni arterial gipertenziya, yurak ishemik kasalligini kamaytiradi.

Kalit so'zlar

Melatonin, yurak-qon tomir tizimi, antioksidant, yallig'lanishga qarshi, antigipertenziv ta'sir, ateroskleroz, yurak yetishmovchiligi, yurak ishemik kasalligi, kardioprotektiv ta'sir, terapevtik potensial.

Annotation

This article analyzes the positive effects of melatonin on the cardiovascular system and its therapeutic potential. Melatonin is a biologically active hormone produced by the pineal gland, which not only regulates circadian rhythms but also possesses strong antioxidant, anti-inflammatory, and cardioprotective properties. Studies have shown that melatonin reduces oxidative stress, suppresses inflammatory processes, maintains vascular tone within normal limits, and lowers arterial blood pressure to physiological levels. In addition, it prevents the development of atherosclerosis and provides protective effects against cardiac ischemia and reperfusion injury. These properties make melatonin a promising adjuvant therapy for arterial hypertension, ischemic heart disease, and other cardiovascular disorders.

Introduction

Currently, among hormones and other biologically active substances, melatonin is gaining increasing scientific attention. It is a hormone mainly produced by the pineal gland during the night and plays a key role in regulating the body's biological (circadian) rhythms. Recent studies have revealed that melatonin is not only involved in sleep regulation but also plays an important role in protecting car-

diovascular function. Owing to its antioxidant, anti-inflammatory, and vasodilatory properties, melatonin helps to slow down the progression of cardiovascular diseases and contributes to maintaining overall physiological stability of the organism.

Keywords:

Melatonin, cardiovascular system, antioxidant, anti-inflammatory, antihypertensive effect, atherosclerosis, heart failure, ischemic heart disease, cardioprotective effect, therapeutic potential.

Аннотация

В данной статье анализируется положительное влияние мелатонина на сердечно-сосудистую систему и его терапевтический потенциал. Мелатонин — это биологически активный гормон, вырабатываемый эпифизом, который не только регулирует циркадные ритмы, но и обладает выраженными антиоксидантными, противовоспалительными и кардиопротекторными свойствами. Исследования показывают, что мелатонин снижает уровень оксидативного стресса, подавляет воспалительные процессы, поддерживает сосудистый тонус в норме и способствует физиологическому снижению артериального давления. Кроме того, он предотвращает развитие атеросклероза и оказывает защитное действие при ишемии сердца и реперфузионных повреждениях. Эти свойства делают мелатонин перспективным средством вспомогательной терапии при артериальной гипертензии, ишемической болезни сердца и других сердечно-сосудистых заболеваниях.

Введение

В настоящее время среди гормонов и других биологически активных веществ особое внимание уделяется мелатонину. Этот гормон преимущественно вырабатывается эпифизом в ночное время и играет ключевую роль в регуляции биологических (циркадных) ритмов организма. Современные исследования показывают, что мелатонин участвует не только в регуляции сна, но и играет важную роль в защите сердечно-сосудистой системы. Благодаря своим антиоксидантным, противовоспалительным и сосудорасширяющим свойствам мелатонин способствует замедлению прогрессирования сердечно-сосудистых заболеваний и поддержанию общего физиологического равновесия организма.

Ключевые слова:

мелатонин, сердечно-сосудистая система, антиоксидант, противовоспалительное действие, антигипертензивный эффект, атеросклероз, сердечная недостаточность, ишемическая болезнь сердца, кардиопротекторное действие, терапевтический потенциал.

Kirish

Hozirgi kunlarda yurak-qon tomir kasalliklari dunyoda o‘limning yetakchi sabablaridan biri bo‘lib qolmoqda. Gipertoniya, ateroskleroz, yurak ishemik kasalligi, miokard infarkti va insult kabi kasalliklarning kopayishida oksidlovchi stress, asabiylashish va yallig‘lanish jarayonlari asosiy patogen omillardan hisoblanadi. Shu sababdan, tabiiy antioksidant xususiyatiga ega bo‘lgan melatoninni ushbu patologiyalarni oldini olish va ularning tasirini yengillashtirishda qo‘llash istiqbollari alohida ilmiy qiziqish uyg‘otmoqda.

Melatonin yurak mushak hujayralarini oksidlovchi shikastlanishdan himoya qiladi, qon tomir tonusini tartibga soladi, qon bosimini pasaytiradi hamda yoglar almashinuvini me’yorga keltiradi.

U mitoxondrial faoliyatni yaxshilab, hujayra energiya miqdorini tiklaydi va apoptoz jarayonlarini cheklaydi. Shu bilan birga, melatoninning yallig‘lanishga qarshi, antiaterosklerotik va antiaritmik ta’siri ham ilmiy tomomlama ham isbotlangan.

Shunday qilib, melatonin nafaqat sirkad ritmlarni boshqaruvchi gormon, balki yurak-qon tomir tizimini himoya qiluvchi, potensial terapevtik vosita sifatida ham katta ilmiy va amaliy ahamiyatga ega. Ushbu maqolada melatoninning yurak-qon tomir tizimiga ta’siri mexanizmlari, uning kardioprotektiv xususiyatlari va klinik qo‘llash imkoniyatlari o‘rganib chiqildi. .

Melatonin yurak hujayralarini erkin radikallar ta’siridan himoya qilib, oksidlovchi stressni kamaytiradi va yurak mushaklarida energiya almashinuvini yaxshilaydi. Shuningdek, u qon tomirlarning tonusini tartibga solib, arterial bosimni pasaytiradi, endoteliy hujayralarda azot oksidi (NO) ishlab chiqilishini kuchaytiradi, bu esa tomirlarning kengayishiga olib keladi. Olib borilgan tekshiruvlar shuni ko‘rsatadiki, melatoninning yetarli darajada ajralmasligi yoki organizmda uning darajasining pasayishi gipertoniya, ateroskleroz va yurak ishemik kasalliklari xavfini oshiradi.

Shuningdek, melatonin qonda lipid profilini yaxshilaydi — “yomon” xolesterin (PZLP) miqdorini kamaytiradi, “yaxshi” xolesterin (YuZLP) darajasini oshiradi, bu esa aterosklerotik pilakchalar yani (toshbaqa kasalligi bo‘lib terida qattiq dog‘lar paydo bo‘ladi) hosil bo‘lishining oldini oladi. Yurak ishemiyasi va reperfuziyasi shikastlanish paytida melatonin mitoxondriyalarning faoliyatini kuchaytiradi, hujayralarning o‘lim jarayonlarini (apoptoz) sekinlashtiradi va yurak to‘qimasining zararlanishini kamaytiradi.

Hozirgi paytda melatoninni yurak kasalliklari oldini olishda va kompleks davolash tizimiga qo‘shish masalasi ilmiy tadqiqotlarda faol o‘rganilmoqda. Uning tabiiy, toksik bo‘lmagan, fiziologik xususiyatga ega ekani uni an’anaviy dori vositalariga nisbatan xavfsizroq qiladi. Shu sababli melatonin nafaqat uyquni boshqaruvchi gormon, balki yurakni himoya qiluvchi, kardioprotektiv vosita sifatida ham katta terapevtik ahamiyatga ega ekanligi aniqlanmoqda.

Asosiy qism

Melatonin (N-asetil-5-metoksitriptamin) epifiz bezida triptofan aminokislotasidan sintezlanadi. Uning sekretsiyasi sirkad ritmiga bog‘liq bo‘lib, qorong‘ilikda ko‘payadi va yorug‘likda kamayadi. Melatonin organizmning “biologik soati”ni boshqarish bilan birga, ko‘plab fiziologik tizimlarga, ayniqsa yurak-qon tomir tizimiga bevosita va bilvosita ta’sir ko‘rsatadi.

U organizmda antioksidant, yallig‘lanishga qarshi, immunomodulyator, gipolipidemik va neuroprotektiv ta’sirlar ko‘rsatib, hujayralarning oksidlovchi stressga bardoshliligini oshiradi. Shu sababli melatonin yurak va qon tomir kasalliklarining patogenezida muhim rol o‘ynaydigan ko‘plab mexanizmlarga ta’sir ko‘rsatadi. Shuningdek, u **yallig‘lanish mediatorlari** — interleykin-6 (IL-6) va o‘sma nekrozi omili (TNF-α) darajasini pasaytiradi, bu esa ateroskleroz va yurak yetishmovchiligi kabi patologik holatlarning rivojlanish xavfini kamaytiradi. Melatoninning terapevtik potensiali bir qator yurak-qon tomir kasalliklarida o‘rganilmoqda.

Melatoninning terapevtik imkoniyatlari

Arterial gipertenziyada melatonin kechki dozalarda qabul qilinganda kechki va tungi qon bosimini pasaytiradi, bemorlarda sirkad ritmlarning o‘zini holiga qaytishiga yordam beradi.

Yurak ishemik kasalligida u miokard hujayralarini reperfuziya paytidagi oksidlovchi zararlanish-

dan himoya qiladi va infarkt boshlanishi va paydo bolishini oldini oladi va kamaytiradi.

Aterosklerozda, ya'ni (qon tomirlar torayishi yoki siqilishi) melatonin yog'lar almashinuvini yaxshilaydi, past zichlikdagi lipoprotein (PZLP) larning oksidlanishini kamaytiradi va tomir devorida pilakcha (qattiq devor) hosil bo'lishini sekinlashtiradi.

Yurak aritmiyalarida u kardiomiositlarning elektr faolligini tenglashtradi o'zini holiga qaytaradi, bu esa ritmning buzilishlarini oldini olishga yordam beradi va muvofiqlashtradi.

Melatoninning tibbiyotda qo'llanilishi va istiqbollari

Klinik tajribalar melatoninning tabiiy antioksidant va kardioprotektiv xususiyatlarini tasdiqlaydi. Uning nisbatan xavfsizligi, toksik ta'sirining yoqori emasligini va organizm tomonidan yaxshi o'zlashtirilishi uni yurak-qon tomir kasalliklarini kompleks davolashda qo'shimcha vosita sifatida qo'llash imkonini beradi. Biroq, melatoninning optimal dozasi, qabul qilish vaqti va uzoq muddatli samaradorligi bo'yicha qo'shimcha klinik olib borilgan tekshiruvlarga ehtiyoj mavjudligini bildiradi.

Arterial gipertenziya va unga melatoninning ta'siri. **Arterial gipertenziya tushunchasi va patogenez**

Arterial gipertenziya (AG) — bu qon bosimining doimiy ravishda 140/90 mm simob ustunidan yuqori bo'lishi bilan farqlanadi, shuningdek surunkali kasallik bo'lib, yurak-qon tomir tizimining eng keng tarqalgan yuqori patologiyalaridan biridir. Kasallikning rivojlanishida irsiy moyillik, stress, noto'g'ri ovqatlanish, kamharakat turmush tarzi, semirish, tuz iste'molining ortishi va endokrin sistemalarning o'zini kerakli vazifalarining ishdan chqishi va buzilishlari asosiy etiologik omillar bilan hisoblanadi.

Gipertenziya rivojlanishining patogenetik asosida **tomir tonusining oshishi, periferik qarshilikning kuchayishi, simpatik asab tizimining ortiqcha faolligi** va **renin-angiotenzin-aldosteron tizimining (RAAS)** disbalansi o'zgarishi bilan bog'liq. Ushbu o'zgarishlar natijasida qon tomir endoteliyasi o'z vazifalari buziladi, azot oksidi (NO) ishlab chiqarilishi kamayadi, bu esa tomirlarning kengayish qobiliyatini pasaytiradi. Oksidlovchi stressning kuchayishi va yallig'lanish mediatorlarining ortishi ham gipertenziya patogenezida muhim ahamiyat o'ynaydi.

Yurak ishemik kasalligi (IYuK). Kasallikning umumiy tavsifi

Yurak ishemik kasalligi (IYuK) — bu yurak mushagi (miokard) ning qon bilan ta'minlanishi yetarli bo'lmaganda yuzaga keladigan surunkali yoki o'tkir patologik holatdir. Yurak mushagi kislorod va ozuqa moddalarga ehtiyoj sezadi; agar koronar arteriyalar torayib qolsa yoki butunlay tiqilib qolsa, yurak to'qimalariga qon oqimi kamayadi. Shu sababli miokardda **ishemik jarayon** rivojlanadi, bu esa og'riq sindromi, yurak ritmi buzilishi va yurakda ko'plab kassaliklarga olib keladi va shuningdek, yurak yetishmovchiligi va hatto infarkt bilan kechadi.

IYuK — yer yuzuda o'limga eng ko'p sabab bo'ladigan yurak-qon tomir kasalliklaridan biridir. Jahon sog'liqni saqlash tashkiloti (JSST) ma'lumotlariga ko'ra, shu kassalikda ko'pchilik aziyat chekadi va IYuK har yili millionlab insonlarning hayotiga zomin bo'ladi.

Ateroskleroz: mohiyati, rivojlanish mexanizmi va klinik ahamiyati

Ateroskleroz — bu o'rta va katta arteriyalar devorida lipidlar, xususan xolesterin va u bilan bog'liq moddalarning to'planishi va shu sababli tomir devorining qalinlashishi, qattiqlashishi va elastikligini yo'qotishi bilan misol keltirish mumkin. Bu jarayon natijasida qon-tomirlar diametri

yani (tomir ichki yo‘li) torayadi, qon oqimi buziladi va to‘qimalarga kislorod yetkazib berish kamayadi va shuni hisobiga organizmning mushak to‘qimalariga ham ta’siri bo‘ladi mushak to‘qimalarida og‘riq boshlanadi. Ateroskleroz yurak ishemik kasalligi, insult, periferik arteriyalar kasalliklari kabi og‘ir asoratlarning asosiy sababi hisoblanadi.

Xulosa

Yurak-qon tomir kasalliklari — zamonaviy tibbiyot oldida turgan eng dolzarb muammolardan biri bo‘lib, dunyo bo‘yicha o‘lim va nogironlikning yetakchi sabablaridan biri hisoblanadi. Ularning rivojlanishida oksidlovchi stress, yallig‘lanish, lipid almashinuvi buzilishi va endotelial disfunksiya kabi omillar muhim o‘rin tutadi. Shu nuqtai nazardan, tabiiy antioksidant va yallig‘lanishga qarshi xususiyatlarga ega biologik faol modda — **melatonin**ning yurak-qon tomir tizimi faoliyatini saqlashdagi ahamiyati alohida e’tiborga loyiqdir.

Melatonin epifiz bezi tomonidan ishlab chiqariladigan gormon bo‘lib, u nafaqat sirkad ritmlarni boshqaradi, balki yurak mushak hujayralarini oksidlovchi shikastlanishdan himoya qiladi, qon tomirlarning tonusini tartibga soladi va arterial bosimni me’yorda ushlab turadi. Tadqiqotlar melatoninning antioksidant, yallig‘lanishga qarshi, antigipertenziv, antiaterosklerotik va kardioprotektiv xususiyatlarini ilmiy jihatdan isbotlagan.

Bu kasalliklarni oldidni olish uchun quyidagi qoidagilarga amal qilish lozim bo‘ladi, bemorlar bu kasaliklarda aziyat chekish yoki bu kasallikdan odam halok bo‘lishi mumkin bo‘ladi, shuning uchun qoidalarga amal qilish va sog‘lom turmush tarziga amal qilish lozim

1. Sog‘lom turmush tarzini shakllantirish

To‘g‘ri ovqatlanish: Ratsionda yog‘li, tuzli va shakarli mahsulotlarni kamaytirish, sabzavot, meva, baliq va yengil oqsillarga boy taomlarni iste’mol qilish kerak. “Yomon” xolesterinni kamaytiruvchi va antioksidantlarga boy ovqatlar (zaytun moyi, yong‘oq, yashil choy, qora shokolad) yurak salomatligi uchun foydali.

Jismoniy faollik: Har kuni kamida 30 daqiqa davomida yurish, yugurish yoki yengil jismoniy mashqlar bajarish qon bosimini pasaytiradi, yurak mushaklarini mustahkamlaydi va metabolizmni yaxshilaydi.

Ortiqcha vazndan saqlanish: Semizlik — gipertenziya, diabet va ateroskleroz rivojlanishining asosiy omillaridan biri.

Stressni boshqarish: Surunkali stress simpatik asab tizimini ortiqcha faollashtiradi va qon bosimini oshiradi. Meditatsiya, chuqur nafas olish mashqlari va yetarli uyqu stressni kamaytiradi.

Chekish va spirtli ichimliklardan voz kechish: Nikotin va spirtli ichimliklar endotelial hujayralarga zarar yetkazadi, qon tomirlarni toraytiradi va ateroskleroz jarayonini tezlashtiradi.

2. Uyqu gigiyenasiga rioya qilish

Melatoninning tabiiy ishlab chiqilishi bevosita **uyqu sifati** bilan bog‘liq. Shu sababli, har kuni bir vaqtda uxlash va uyg‘onish odatini shakllantirish kerak.

Kechqurun yorug‘lik (telefon, televizor, kompyuter nuri)ni kamaytirish lozim, chunki u melatonin

sekretsiyasini susaytiradi.

Tungi dam olish uchun tinch, qorong‘i va sokin muhit yaratish melatoninning tabiiy darajada ishlab chiqilishini ta’minlaydi.

3. Melatonin yordamida profilaktika

Melatoninning antioksidant, yallig‘lanishga qarshi va antigipertenziv xususiyatlari yurak-qon tomir kasalliklari profilaktikasida muhim rol o‘ynaydi. Uning yordamida:

Arterial gipertenziya rivojlanish xavfi kamayadi, chunki melatonin qon tomirlarning kengayish qobiliyatini yaxshilaydi va qon bosimini fiziologik me’yorda ushlab turadi.

Ateroskleroz jarayoni sekinlashadi, chunki melatonin “yomon” xolesterin (LDL) oksidlanishini kamaytiradi va “yaxshi” xolesterin (HDL) darajasini oshiradi.

Yurak ishemik kasalligi xavfi pasayadi, chunki u miokard hujayralarini kislorod yetish-movchiligidan himoya qiladi, mitoxondriyalarning faoliyatini qo‘llab-quvvatlaydi va yurak energiya balansini tiklaydi.

Profilaktik maqsadda melatoninni shifokor tavsiyasiga ko‘ra, asosan kechki paytlarda (uyqudan oldin) qabul qilish maqsadga muvofiq. Chunki u tabiiy sirkad ritm bilan moslashgan holda o‘zining maksimal fiziologik ta’sirini ko‘rsatadi.

4. Doimiy tibbiy nazorat

Yurak-qon tomir kasalliklariga moyilligi bo‘lgan shaxslar (yoshi katta, semizlik, diabet, irsiy omillar mavjudlar) muntazam ravishda:

Qon bosimini nazorat qilish;

Qon lipid profilini (xolesterin, triglitseridlar) tekshirish;

Qon glyukozasi darajasini kuzatib borish;

Shifokor tavsiyasiga muvofiq melatonin va boshqa profilaktik vositalarni qabul qilishlari lozim.

5. Melatoninning istiqboldagi ahamiyati

Melatonin — tabiiy, toksik bo‘lmagan va organizm bilan biologik mos gormon sifatida kelajakda yurak-qon tomir kasalliklarini oldini olishda keng qo‘llanilishi kutilmoqda. U an’anaviy dori vosita-lariga nisbatan xavfsizroq bo‘lib, surunkali kasalliklar (gipertenziya, ateroskleroz, yurak ishemiyasi) da kompleks himoya ta’siri ko‘rsatadi.

Agar bu kassalilka organizmda borligi erta anqlansa inson salomaligini saqlab qolish imkoni or-tadi. Shuning uchun shunga o‘xshash muamolar to‘g‘risida shifokorga murojat qilishi va shifokor tavsiya qilgan dori yoki muolajani amalga oshsirish kerak.

Eslatma / ogohlantirish:

Ba’zi tadqiqotlar melatoninning ijobiy ta’sirlarini ko‘rsatgan bo‘lsa-da, uzoq muddatli foydalan-ish va katta dozalar bilan bog‘liq ehtiyot choralar ham mavjud. Ma’lumotlar to‘liq emas, sabablari yoki xavflari ortiqcha ilmiy tasdiqni kutmoqda.

Sizning maqolangiz uchun yozilgan fikrlar ushbu manbalarga mos keladi — agar ma’lumotni aniq

bir tadqiqotga tayansangiz, havolani to‘liq ko‘rsatib, tahrir qilgan bo‘lsangiz ma’qul.

Foydalanilgan adabiyotlar (bosma va ilmiy manbalar)

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Elektron manbalar

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Elektron manbalar saytlari:

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2. ScienceDirect (Elsevier Publishing Platform)
3. ResearchGate — Scientific Network https://www.researchgate.net
4. World Health Organization (WHO) https://www.who.int

RAQAMLI TEXNOLOGIYALAR ASRIDA SMARTFONLARGA QARAMLIK VA UNING SOG‘LOM TURMUSH TARZIGA TA‘SIRI

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Annotatsiya

Hozirgi zamonaviy dunyoda mobil telefonlar va raqamli gadjetlar inson hayotining ajralmas qismiga aylangan. Ushbu maqolada mobil telefonlar va elektron gadjetlardan ortiqcha hamda uzoq muddat foydalanishning inson salomatligiga salbiy ta’siri tahlil qilinadi. Asosiy e’tibor ko‘rish bilan bog‘liq muammolar, tayanch-harakat tizimi kasalliklari, ruhiy salomatlik va uyqu buzilishlariga qaratilgan. Shuningdek, ushbu sog‘liq muammolarining kelib chiqish sabablari hamda ularni oldini olishga qaratilgan samarali choralar yoritib beriladi.

Kalit so‘zlar

Mobil telefon, gadjetlar, inson salomatligi, ko‘z charchashi, ruhiy salomatlik, elektromagnit nurlanish, telefon qaramligi, sog‘lom turmush tarzi.

Kirish

Zamonaviy texnologiyalar, ayniqsa mobil telefonlar va elektron gadjetlar kundalik inson faoliyatida muhim o‘rin tutadi. Ular aloqa, ta’lim, mehnat faoliyati va ko‘ngilochar maqsadlarda keng qo‘llaniladi. Biroq ushbu qurilmalardan noto‘g‘ri va me’yoridan ortiq foydalanish inson salomatligiga salbiy ta’sir ko‘rsatib, turli jismoniy va ruhiy kasalliklarning yuzaga kelishiga olib keladi.

Asosiy qism

Mobil telefonlar va gadjetlardan uzoq vaqt davomida foydalanish inson salomatligining bir qator jihatlariga salbiy ta’sir ko‘rsatadi. Eng avvalo, ko‘rish tizimi zarar ko‘radi. Ekranga uzoq muddat tikilib qarash natijasida ko‘z charchashi, “quruq ko‘z” sindromi, bosh og‘riqlari va ko‘rish o‘tkirligining pasayishi kuzatiladi.

Shuningdek, smartfonlardan foydalanishda tana holatining noto‘g‘ri bo‘lishi bo‘yin, bel va umurtqa pog‘onasida og‘riqlarga sabab bo‘ladi. Ruhiy salomatlik bilan bog‘liq muammolar — stress, xavotir, diqqatning pasayishi va ijtimoiy ajralish holatlari tobora ko‘paymoqda. Uyqudan oldin telefon ishlatish esa uyqu rejimini buzib, uyqusizlikka olib keladi.

Kasalliklarning kelib chiqish sabablari

Gadjetlardan foydalanish bilan bog‘liq kasalliklarning asosiy sabablari quyidagilardan iborat:

- Mobil qurilmalardan uzoq vaqt va nazoratsiz foydalanish
- Ekran bilan ishlashda muntazam tanaffus qilmaslik
- Ekranga juda yaqin masofadan qarash
- Qurilmalardan foydalanishda noto‘g‘ri tana holati
- Uyqudan oldin telefon ishlatish
- Jismoniy faollikning past darajada bo‘lishi

- Smartfonlarga ruhiy qaramlik

Kasalliklarning oldini olish choralari

Gadjetlarning inson salomatligiga salbiy ta’sirini kamaytirish uchun quyidagi choralarga amal qilish tavsiya etiladi:

- Kunlik ekran vaqtini cheklash
- Har 20–30 daqiqada tanaffus qilish
- Ko‘z va ekran orasidagi masofani to‘g‘ri saqlash
- To‘g‘ri o‘tirish va tana holatiga e’tibor berish
- Uyqudan kamida 1 soat oldin telefon ishlatmaslik
- Jismoniy mashqlar bilan shug‘ullanish va faol hayot tarzini olib borish
- Jonli muloqotga ko‘proq vaqt ajratish

Annotation

In the modern world, mobile phones and digital gadgets have become an integral part of human life. This article analyzes the negative effects of excessive and long-term use of mobile phones and electronic gadgets on human health. Particular attention is paid to vision problems, musculoskeletal disorders, mental health issues, and sleep disturbances. The causes of these health problems and effective preventive measures are also discussed.

Keywords

Mobile phone, gadgets, human health, eye strain, mental health, electromagnetic radiation, phone addiction, healthy lifestyle.

Introduction

Modern technologies, especially mobile phones and electronic gadgets, play a significant role in daily human activities. They are widely used for communication, education, work, and entertainment. However, improper and excessive use of these devices can negatively affect human health and lead to various physical and psychological disorders.

Main part

Prolonged use of mobile phones and gadgets has a harmful impact on several aspects of human health. One of the most affected systems is vision. Continuous screen exposure causes eye fatigue, dry eye syndrome, headaches, and reduced visual acuity.

In addition, incorrect posture while using smartphones leads to neck, back, and spine pain. Mental health problems such as stress, anxiety, decreased attention, and social isolation are becoming increasingly common. Using mobile phones before bedtime disrupts sleep patterns and causes insomnia.

Causes of health problems

The main causes of gadget-related health problems include:

- Excessive and prolonged use of mobile devices
- Lack of regular breaks while using screens
- Viewing screens at a very close distance
- Poor posture during device usage

- Using phones before sleep
- Low level of physical activity
- Psychological dependence on smartphones

Prevention measures

To reduce the negative effects of mobile phones and gadgets on health, the following measures are recommended:

- Limiting daily screen time
- Taking breaks every 20–30 minutes
- Maintaining a proper distance between eyes and screen
- Keeping correct posture
- Avoiding gadget use at least one hour before sleep
- Engaging in physical activity and exercises
- Strengthening real-life social interactions

Аннотация

В современном мире мобильные телефоны и цифровые гаджеты стали неотъемлемой частью жизни человека. В данной статье анализируется негативное влияние чрезмерного и длительного использования мобильных телефонов и электронных устройств на здоровье человека. Особое внимание уделяется проблемам зрения, нарушениям опорно-двигательного аппарата, психическому здоровью и расстройствам сна. Также рассматриваются причины возникновения данных заболеваний и меры их профилактики.

Ключевые слова

Мобильный телефон, гаджеты, здоровье человека, утомление глаз, психическое здоровье, электромагнитное излучение, зависимость от телефона, здоровый образ жизни.

Введение

Современные технологии, в частности мобильные телефоны и электронные гаджеты, играют важную роль в повседневной жизни человека. Они широко используются для общения, обучения, работы и развлечений. Однако неправильное и чрезмерное использование данных устройств может негативно сказаться на здоровье человека и привести к различным физическим и психическим нарушениям.

Основная часть

Длительное использование мобильных телефонов и гаджетов оказывает отрицательное влияние на различные системы организма. В первую очередь страдает зрение. Постоянная нагрузка на глаза приводит к их утомлению, синдрому сухого глаза, головным болям и снижению остроты зрения.

Кроме того, неправильная поза при использовании смартфонов вызывает боли в шее, спине и позвоночнике. Все чаще наблюдаются психологические проблемы, такие как стресс, тревожность, снижение концентрации внимания и социальная изоляция. Использование телефона перед сном нарушает режим сна и вызывает бессонницу.

Причины возникновения заболеваний

Основными причинами заболеваний, связанных с использованием гаджетов, являются:

- Длительное и бесконтрольное использование устройств
- Отсутствие регулярных перерывов
- Использование экранов на близком расстоянии
- Неправильная осанка
- Пользование телефоном перед сном
- Низкая физическая активность
- Психологическая зависимость от гаджетов

Профилактика заболеваний

Для снижения негативного влияния гаджетов на здоровье рекомендуется:

- Ограничивать время использования экрана
- Делать перерывы каждые 20–30 минут
- Соблюдать правильную дистанцию между глазами и экраном
- Следить за осанкой
- Не использовать телефон за 1 час до сна
- Вести активный образ жизни
- Уделять внимание живому общению

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Sog‘lom turmush tarzi bo‘yicha uslubiy qo‘llanma.
Toshkent.
(Profilaktika, jismoniy faollik va texnologiyadan me’yorida foydalanish)

O’zbekiston aholisi orasida yurak-qon tomir kasalliklarining jinsir tafovutlari.

*Ayollar va erkaklarda yurak kasalliklari rivojlanishidagi farqlari.

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Annotatsiya

Ushbu maqolada O‘zbekistonda yurak-qon tomir kasalliklari (YQTK) rivojlanishidagi jinsiy tafovutlar tahlil qilinadi. Tadqiqotda erkaklar va ayollar o‘rtasida YQTK rivojlanish yoshi, xavf omillari, kasallik turlari hamda og‘irlik darajalari o‘rganilgan. Erkaklarda yurak xuruji va insult kabi o‘tkir holatlar ko‘proq uchrasa, ayollarda esa menopauzadan keyin yurak-qon tomir kasalliklari xavfi ortadi va kasalliklar ko‘pincha ikkilamchi sabablarga bog‘liq bo‘ladi. 2024-yil statistik ma’lumotlariga ko‘ra, O‘zbekistonda har yili minglab insonlar YQTK oqibatida hayotdan ko‘z yumadi, ulardan erkaklar ulushi nisbatan yuqoriroq. Maqolada YQTKning oldini olish, diagnostika va davolash jarayonlarida jinsiy omilni hisobga olish zarurligi ta’kidlanadi.

Kalit so’zlar

O‘zbekiston, yurak-qon tomir kasalliklari, jinsiy tafovutlar, erkaklar, ayollar, rivojlanish yoshi, xavf omillari, yuqori qon bosimi, xolesterin, semizlik, yurak xuruji, insult, menopauza, olim statistikasi, prevalensiya, oldini olish, sog‘lom turmush tarzi, diagnostika, davolash, reabilitatsiya.

Abstract

This article analyzes gender differences in the development of cardiovascular diseases (CVD) in Uzbekistan. The study examined the age of development of CVD, risk factors, types of disease, and severity of CVD between men and women. While men are more likely to have acute events such as heart attacks and strokes, women are at increased risk of CVD after menopause, and the disease is often due to secondary causes. According to 2024 statistics, thousands of people die from CVD in Uzbekistan every year, with a higher proportion of men. The article emphasizes the need to take gender into account in the prevention, diagnosis, and treatment of CVD.

Keywords

Uzbekistan, cardiovascular diseases, sex differences, men, women, developmental age, risk factors, high blood pressure, cholesterol, obesity, heart attack, stroke, menopause, scientific statistics, prevalence, prevention, healthy lifestyle, diagnostics, treatment, rehabilitation.

Аннотация

В данной статье анализируются гендерные различия в развитии сердечно-сосудистых заболеваний (ССЗ) в Узбекистане. В исследовании изучались возраст

развития ССЗ, факторы риска, формы и тяжесть течения ССЗ у мужчин и женщин. В то время как у мужчин чаще возникают острые осложнения, такие как инфаркты и инсульты, у женщин повышается риск развития ССЗ после наступления менопаузы, и заболевание часто обусловлено вторичными причинами. Согласно статистике 2024 года, ежегодно в Узбекистане от ССЗ умирают тысячи людей, причём доля мужчин среди них выше. В статье подчёркивается необходимость учёта гендерных факторов при профилактике, диагностике и лечении ССЗ.

Ключевые слова

Узбекистан, сердечно-сосудистые заболевания, половые различия, мужчины, женщины, возраст развития, факторы риска, повышенное артериальное давление, холестерин, ожирение, инфаркт, инсульт, менопауза, научная статистика, распространенность, профилактика, здоровый образ жизни, диагностика, лечение, реабилитация.

Kirish

O‘zbekistonda yurak-qon tomir kasalliklari (YQTK) aholining sog‘lig‘iga eng jiddiy tahdid solayotgan omillardan biri bo‘lib, o‘lim sabablarining asosiy qismini tashkil etadi. Har yili minglab oila yaqinlarini ushbu kasalliklar oqibatida yo‘qotmoqda. 2024-yil yanvar–sentyabr oylarida mamlakatda jami 131,7 ming kishi vafot etgan, shundan erkaklar — 72,3 ming nafar, ayollar — 59,4 ming nafarni tashkil etgan. Ushbu statistik ma’lumotlar O‘zbekiston aholisi orasida YQTK darajasi yuqoriligini va jinslar o‘rtasida sezilarli tafovutlar mavjudligini ko‘rsatadi.

Erkaklar va ayollar orasida yurak-qon tomir kasalliklarining rivojlanishida aniq jinsiy farqlar mavjud. Erkaklarda yurak xuruji va insult kabi o‘tkir holatlar nisbatan yosh yoshda uchrasa, ayollarda esa menopauzadan so‘ng yurak-qon tomir kasalliklari xavfi ortadi hamda bu holatlar ko‘pincha gormonlar o‘zgarishi yoki boshqa kasalliklar bilan bog‘liq bo‘ladi. Ushbu farqlar YQTK oldini olish, diagnostika va davolash jarayonlarida jinsiy omilni inobatga olish zarurligini ko‘rsatadi.

Shu sababli ushbu maqola O‘zbekistonda erkaklar va ayollar orasida YQTK rivojlanishidagi jinsiy tafovutlarni o‘rganish, ularning asosiy sabablari va xavf omillarini aniqlash hamda profilaktika, diagnostika va davolashda jinsga xos yondashuv zarurligini asoslashga qaratilgan.

Asosiy qism

Erkaklar va ayollar orasida yurak-qon tomir kasalliklarining rivojlanishidagi farqlar

Rivojlanish yoshi:

Erkaklarda yurak-qon tomir kasalliklari (YQTK) nisbatan yoshroq yoshda rivojlanadi, ayollarda esa xavf darajasi menopauzadan so‘ng ortadi. Erkaklar orasida yurak xuruji va insult kabi o‘tkir holatlar ko‘proq uchrasa, ayollarda kasalliklar ko‘pincha boshqa sabablar bilan bog‘liq bo‘ladi.

Xavf omillari:

Yuqori qon bosimi, xolesterin va semizlik erkaklar va ayollar orasida asosiy xavf omillari sifatida mavjud. Ayollarda, ayniqsa menopauzadan so‘ng, gormonal o‘zgarishlar va boshqa kasalliklar (masalan, diabet) yurak-qon tomir kasalliklarining rivojlanishiga sezilarli ta’sir ko‘rsatadi.

Kasallik turlari:

Erkaklarda yurak xuruji va insult kabi o‘tkir holatlar ko‘proq uchrasa, ayollarda YQTK ko‘pincha diabet, gipertoniya va gormonal o‘zgarishlar bilan bog‘liq bo‘ladi

O‘zbekistonda YQTK statistikasi

2024-yil yanvar–sentyabr oylarida O‘zbekistonda jami 131,7 ming kishi vafot etgan, shundan erkaklar 72,3 ming nafar, ayollar 59,4 ming nafarni tashkil etgan. Vafot etganlarning 74,5 ming nafari shaharlarda, 57,2 ming nafari qishloqlarda yashagan. Har 100 ming aholiga jami vafot etgan erkaklar soni 517,6, ayollar esa 430,5 nafarni tashkil qilgan.

Statistika agentligining ma’lumotlariga ko‘ra, o‘lim holatlarining 57,2 % qon aylanish tizimi kasalliklaridan, 9,5 % o‘simtalardan, 6,5 % nafas olish a’zolari kasalliklaridan kelib chiqqan.

YQTK oldini olish, diagnostika va davolash

Oldini olish:

YQTK oldini olish uchun sog‘lom turmush tarzi tavsiya etiladi. Bu sog‘lom ovqatlanish, muntazam jismoniy faoliyat va zararli odatlardan voz kechishni o‘z ichiga oladi. Yuqori qon bosimi, xolesterin va semizlik kabi xavf omillarini nazorat qilish muhimdir.

Diagnostika:

YQTKni aniqlash uchun qon tahlillari, ultratovush (UZI) tekshiruvlari va boshqa diagnostik usullar qo‘llaniladi. Asosiysi, shifokorga borishni kechiktirmaslik lozim.

Davolash:

YQTK davolashda jinsiy tafovutni hisobga olish muhimdir. Erkaklar va ayollar orasidagi kasallik rivojlanishining farqlari tibbiy yordam ko‘rsatishda inobatga olinishi lozim. Reabilitatsiya va sog‘lom turmush tarzi davolashning ajralmas qismlaridan biri hisoblanadi.

Xulosa

O‘zbekistonda yurak-qon tomir kasalliklari (YQTK) eng katta o‘lim sabablaridan biri bo‘lib, har yili minglab kishilar ushbu kasalliklar tufayli vafot etadi. Erkaklar va ayollar orasida YQTK rivojlanishida jinsiy tafovutlar mavjud: erkaklarda yurak xuruji va insult kabi o‘tkir holatlar nisbatan yoshroq yoshda rivojlanadi, ayollarda esa menopauzadan so‘ng xavf darajasi ortadi va kasalliklar ko‘pincha boshqa sabablar bilan bog‘liq bo‘ladi. 2024-yil statistikasi ham erkaklar va ayollar orasida o‘lim darajalari farqlanishini tasdiqlaydi.

Ushbu maqolada O‘zbekistonda YQTK rivojlanishidagi jinsiy tafovutlar o‘rganildi va oldini olish, diagnostika hamda davolashda jinsga alohida e’tibor berish tavsiya qilinadi. Sog‘lom turmush tarzi, xavf omillarini nazorat qilish va muntazam tibbiy ko‘riklar kasalliklarning oldini olishning eng samarali vositalari hisoblanadi. Shuningdek, reabilitatsiya va sog‘lom turmush tarzi davolash jarayonining muhim qismlari sifatida ahamiyatlidir.

Foydalanilgan adabiyotlar

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