4/2017

Deutscher Wissenschaftsherold





Berlin ★

Bibliografische Information der Deutschen Nationalbibliothek

Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über http://dnb.dnb.de abrufbar.

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at http://dnb.dnb.de .

Information bibliographique de la Deutsche Nationalbibliothek

La Deutsche Nationalbibliothek a répertorié cette publication dans la Deutsche Nationalbibliografie; les données bibliographiques détaillées peuvent être consultées sur Internet à l'adresse http://dnb.dnb.de .

Informazione bibliografica della Deutsche Nationalbibliothek

La Deutsche Nationalbibliothek registra questa pubblicazione nella Deutsche Nationalbibliografie; dettagliati dati bibliografici sono disponibili in internet in http://dnb.dnb.de.

Библиографическая информация Немецкой Национальной Библиотеки

Немецкая Национальная Библиотека вносит эту публикацию в Немецкую национальную библиографию; подробные библиографические данные можно найти в интернете на странице: http://dnb.dnb.de.

Información bibliográfica de la Deutsche Nationalbibliothek

La Deutsche Nationalbibliothek recoge esta publicación en la Deutsche Nationalbibliografie. Los datos bibliográficos están disponibles en la dirección de Internet http://dnb.dnb.de . ISSN 2509-4327 (print) ISSN 2510-4780 (online)





Deutscher Wissenschaftsherold German Science Herald

Nº 4/2017

Die Zeitschrift "Deutscher Wissenschaftsherold" ist eine Veröffentlichung mit dem Ziel ein breites Spektrum der Wissenschaft allgemeinverständlich darzustellen. Die Redaktionsleitung versteht sich als Vermittler zwischen Wissenschaftlern und Lesern. Durch die populärwissenschaftliche Bearbeitung wird es möglich unseren Lesern neue wissenschaftliche Leistungen am besten und vollständigsten zu vermitteln. Es werden Untersuchungen, Analysen, Vorlesungen, kurze Berichte und aktuelle Fragen der modernen Wissenschaft veröffentlicht.

Impressum

Deutscher Wissenschaftsherold - German Science Herald Wissenschaftliche Zeitschrift Herausgeber: InterGING Sonnenbrink 20 31789 Hameln, Germany Inhaber: Marina Kisiliuk Tel.: + 49 51519191533 Fax.:+ 49 5151 919 2560 Email: info@dwherold.de Internet:www.dwherold.de Chefredakeur/Editor-in-chief: Marina Kisiliuk Korrektur: O. Champela Gestaltung: N. Gavrilets

Auflage: № 4/2017 (September) – 28 Redaktionsschluss September, 2017 Erscheint vierteljährlich Editorial office: InterGING Sonnenbrink 20 31789 Hameln, Germany Tel.: + 49 51519191533 Fax.:+ 49 5151 919 2560 Email: info@dwherold.de Deutscher Wissenschaftsherold - German Science Herald is an international, German/English language, peer-reviewed, quarterly published journal. № 4/2017 Passed in press in September 2017 Druck: WIRmachenDRUCK GmbH Mühlbachstr. 7 71522 Backnang Deutschland

Der Abdruck, auch auszugsweise, ist nur mit ausdrücklicher Genehmigung der InterGING gestattet. Die Meinung der Redaktion oder des Herausgebers kann mit der Meinung der Autoren nicht übereinstimmen. Verantwortung für die Inhalte übernehmen die Autoren des jeweiligen Artikels.

INDEXING: Google Scolar, WorldCat, InfoBase Index, Journal Index, Citefactor, International Scientific Indexing, JIFACTOR, Scientific Indexing Services, International Institute of Organized



© InterGING © Deutscher Wissenschaftsherold – German Science Herald

REDAKTIONSKOLLEGIUM / INTERNATIONAL EDITORIAL BOARD:

Jurga Bernatoniene, Dr., Prof. Physics Lithuania *jurgabernatoniene@yahoo.com*

Arvaidas Galdikas, Dr. habil., professor Physics Lithuania, arvaidas.galdikas@ktu.lt

Kristina Ramanauskienė, Ph.dr., Prof. Pharmacy, Lithuania kristinaraman@gmail.com

Khpaliuk Alexander, Dr. med. habil., Prof. Pharmakologie, Belorus *clinicfarm@bsmu.by*

Arnold M. Gegechkori, Dr., full Prof. Biology, Georgia arngegechkori@yahoo.com

Omari Mukbaniani, Prof., DSc. Chemistry, Georgia *omar.mukbaniani@tsu.ge*

Teimuraz Lezhava, Prof. Genetics, Georgia teimuraz.lezhava@tsu.ge

Shota A. Samsoniya, Prof. Chemistry, Georgia shota.samsonia@tsu.ge

Mdzinarashvili Tamaz, DSc., Prof. Biophysics, Georgia tamaz.mdzinarashvili@tsu.ge

Aliaksandr V.Prokharau, MD, PhD, MSc Prof. Oncology, Belarus *aprokharau@gmail.com*

Pyrochkin V., MD, PhD, MSc Prof. Theraphy, Belarus *wlad_cor@mail.ru*

Golubev A.P., BD, Prof. Ecology, Belarus algiv@rambler.ru

Makarevich A., MD, PhD, Prof. Theraphy, Belarus makae@bsmu.by

Kanunnincova N., BD, Prof. Physiology, Belarus n.kanunnikova@grsu.by

Giedrius Vanagas, Prof. Internal Medicine, Lithuania Giedrius.Vanagas@lsmuni.lt

Armuntas Baginskas, Prof. Neurofiziologija, Lithuania Armuntas.Baginskas@lsmuni.lt

Ricardas Radisauskas, MD., Ph.D., Prof. Cardiology, Lithuania *Ricardas.Radisauskas@lsmuni.lt*

Meyramov Gabit, Prof. Cytology and Histology, Kazakhstan meyramow@mail.ru

Aisha Mohammed Abd al-salam Shahlol Ph.D. in Medical Bacteriology, Libya Ais.shahlol@sebhau.edu.ly Edmundas Kadusevicius, MD, PharmD, PhD, Prof. Pharmacology, Lithuania Edmundas.Kadusevicius@lsmuni.lt

Ivo Grabchev, Prof., PhD. Chemistry, Bulgaria *i.grabchev@chem.uni-sofia.bg* grabchev@mail.bg

Mariyana Ivanova Lyubenova, Prof., PhD. Ecology, Bulgaria *ryann@abv.bg ryana_l@yahoo.com*

Tsvetanka Tsankova Marinova, MD, PhD, DMedSci, Biologv. Bulgaria *tmarinova@yahoo.com*

Evgueni D. Ananiev, Prof PhD, Biology. Bulgaria evgueni_ananiev@yahoo.com

Plamen G. Mitov, Prof., PhD. Biology, Bulgaria mitovplamen@gmail.com

Atanas Dimov Arnaudov, Ph.D. Physiology, Bulgaria arny87@yahoo.co.uk

Iliana Georgieva Velcheva, PhD, Ecology, Bulgaria anivel@abv.bg

Osman Demirhan, Prof. Biology, Turkey osdemir@cu.edu.tr

Jharna Ray, M. Sc., PhD, Prof. Neurogenetics, India Indiajharnaray@gmail.com

Marián Halás doc. RNDr, Ph.D. Human geography, Czech marian.halas@upol.cz

Ayfer Pazarbasi Prof.Dr. Biology, Turkey payfer@cu.edu.tr

Tusharkanti Ghosh Prof. Physiology, India tusharkantighosh53@yahoo.in

Khudaverdi Gambarov Gambarov, Prof. Microbiology, Azerbaijan khuda1949@mail.ru

Rovshan Ibrahimkhalil Khalilov, Prof. Biophysics, Azerbaijan hrovshan@hotmail.com

Svitlana Antonyuk, Dr.phil. Stony Brook University, USA Linguistics

Samuel M.Johnson, Prof.Dr.phil. Theology, Wells, Maine, USA *djtjohnson@earthlink.net*

Satanovsky Leon MD/PhD. Perio-odontologie, Israel satleonid@gmail.com

Lists of references are given according to the Vancuver style

DDC-UDC 616.831-005.4-005-07:616.379-008.64]-092.9

DOI:10.19221/201741

Galagdina A.A., Dmytrenko R.R., Bambuliak A.V.

Department of Surgical and Pediatric Dentistry, Higher State Educational Establishment of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine

DIAGNOSTICS OF ISCHEMIC-REPERFUSION DAMAGE OF THE BRAIN IN RATS AFFLICTED WITH DIABETES MELLITUS

Abstract. Diagnostics of ischemic-reperfusion damage of the brain in rats in case of diabetes mellitus is made under conditions of ischemia-reperfusion of the brain against the ground of three-month diabetes mellitus by collagenolysis. Bilateral carotid ischemia-reperfusion against the ground of three-month diabetes mellitus inhibits collagenolysis on the frontal cortex and hippocampus of the brain in rats. Application of the method suggested has enabled to determine the criteria to asses the development of ischemic-reperfusion damage of the brain with diabetes mellitus in rats which will promote further studies concerning the cerebral tissue state under conditions of comorbid pathology. **Key words:** collagenolysis, diabetes mellitus, ischemia-reperfusion.

Introduction. Cerebrovascular pathology is known to be one of the most topical issues of modern medicine which is caused by an increased occurrence of vascular diseases. Ischemic damages of the brain attract special attention. They constitute more than 2/3 of all the cerebrovascular diseases. Therefore, the process of cerebral ischemia is much determinable concerning the level of health and life span [1]. Acute stroke remains one of the leading problems in modern medicine, first of all due to high disability and mortality of the adult population of the planet [2]. Nowadays the existence of causeand-effect relations between diabetes mellitus available and a high risk of cerebral circulation disorders including dyscirculatory encephalopathy and vascular dementia does not give rise to any doubt [3]. According to the WHO definition diabetes mellitus has become noninfectious epidemic. Today there are 240 million people on the globe suffering from diabetes mellitus, and till 2030 this number will increase to 330 or probably to 500 million of people. In 01.01.2007 in Ukraine 1048375 diabetic patients were registered, which was 2242,6 cases per 100 000 of population. Due to this fact the issues of increased occurrence of chronic complications of diabetes mellitus, investigation of the mechanism of its development, diagnostic peculiarities and elaboration of effective means of treatment and prevention are of great importance

[4,5,6].

Objective: to improve the diagnostics of cerebral damage in case of bilateral carotid ischemia-reperfusion against the ground of three-month diabetes mellitus by collagenolysis in the frontal cortex and hippocampus of rats.

Materials and methods. Diabetes mellitus was simulated by means of a single intraperitoneal injection of streptozotocin (Sigma, Aldrich) in the dose of 60 mg/kg given to male rats at the age of two months. Duration of diabetes was three months. To make bilateral carotid ischemiareperfusion both general carotid arteries were isolated under intraperitoneal narcosis (calipsol, 75 mg/kg) by means of the anterior cervical access. The arteries were clipped for 20 minutes, afterwards the clips were removed for reperfusion during 1 hours. The animals were killed by means of decapitation under calipsol narcosis. After fixation of the brain in liquid nitrogen, using the atlas of stereotaxic coordinates, the cortex of the frontal lobe and CA1, CA2 and CA3 fields of the hippocampus were taken for examination. Tissue proteolytic activity was studied homogenates of the structures indicated.

The study was conducted on 13 male nonlinear rats of four groups: control rats, rats after bilateral carotid ischemia-reperfusion, rats with diabetes mellitus and rats with diabetes mellitus exposed to carotid ischemia-reperfusion. **Results and discussion.** The peculiarities of stroke are determined by pre-stroke (underlying) condition of the cerebral metabolism, its energy requirements and status and response of the nervous-immune-endocrine system of the body. Among underlying diseases against the ground of which cerebral ischemia develops diabetes mellitus is one of the most spread. Diabetes mellitus increases the risk of development of ischemic lesions of the brain in several times. Such complications of diabetes mellitus as coma are of special importance, as they result in the development of incomplete global ischemia of the brain with further reperfusion, and which is additional complication of energy disorders of the

nerve cells and glia. In the complex of topical responses occurring in case of ischemiareperfusion changes in the tissue proteolysis systems play an important role, which is a marker of tissue response to stress. Condition of the tissue proteolysis determines pathogenesis of ischemic-reperfusion changes, degree of cellular damage, adaptation and survival of the afflicted cerebral tissue very much.

To examine proteolytic activity collagenolysis was investigated. The results of the study are presented in Table 1.

The indices of all the structures of the brain studied responded to diabetes mellitus and bilateral carotid ischemia-reperfusion in one Table 1

Effect of ischemia-reperfusion on the indices of tissue proteolysis in the frontal cortex and di	fferent
fields of the hippocampus of male rats under conditions of diabetes mellitus ($M\pm\tau,\pi=12$	L)

	Group of the study	Collagenolysis (mkg azocol/g of
		tissue per hour)
Cortex of	Control	5,10±0,131
the frontal Ischemia-reperfusion		5,70±0,151
lobe		P1<0,01
	Diabetes mellitus	6,10±0,533
	Diabetes mellitus and ischemia-	3,89±0,549
	reperfusion	p2<0,01
		рз<0,01
Field	Control	6,06±0,180
CA1	Ischemia-reperfusion	6,58±0,310
	Diabetes mellitus	7,33±0,825
	Diabetes mellitus and ischemia-	4,67±0,581
	reperfusion	рг<0,05
		p₃<0,05
Field	Control	5,71 ±0,133
CA2	Ischemia-reperfusion	7,92±0,382
		pi<0,001
	Diabetes mellitus	7,76±0,550
		Pi<0,01
	Diabetes mellitus and ischemia-	5,60±0,573
	reperfusion	p ₂ <0,05
		pi<0,01
Field	Control	4,86±0,126
CA3	Ischemia-reperfusion	6,63+0,112
		pi<0,001
	Diabetes mellitus	7,33±0,642
		pi<0,01
	Diabetes mellitus and ischemia-	5,04±0,441
	reperfusion	p ₂ <0,01
		pi <0,01

Notes: difference probability in comparison with: pi - control, p₂ - diabetes, p3 – ischemia-reperfusion.

direction or did not respond, thus discordant changes were absent.

A peculiar feature of changes in the tissue proteolysis in response to combination of bilateral carotid ischemia-reperfusion and three-month diabetes mellitus is decreased collagenolysis in all the structures examined.

Conclusion. Diagnostics of ischemicreperfusion damage of the brain in rats in case of diabetes mellitus is made under conditions of ischemia-reperfusion of the brain against the ground of three-month diabetes mellitus by collagenolysis. Bilateral carotid ischemiareperfusion against the ground of three-month diabetes mellitus inhibits collagenolysis on the frontal cortex and hippocampus of the brain in rats. Application of the method suggested has enabled to determine the criteria to asses the development of ischemic-reperfusion damage of the brain with diabetes mellitus in rats which will promote further studies concerning the cerebral tissue state under conditions of comorbid pathology.

References.

1. Skvorcova VI, Stahovskaja LV, Narcissov JaR. Randomizirovannoe dvojnoe slepoe placebokontroliruemoe issledovanie jeffektivnosti i bezopasnosti meksidola v kompleksnoj terapii ishemicheskogo insul'ta v ostrom periode. Zhurn Nevrol i psihiatr. 2006;8:52-9.

2. Fassbender K, Balucani S. Streamlining of prehospital stroke management: the golden hour Lancet Neurol. 2013;12:585-96.

3. Minnerup J, Wersching H, Schilling M, Schabitz WR. Analysis of early phase and subsequent phase III stroke studies of neuroprotectants: outcomes and predictors for success. Exp Transl Stroke Med. 2014;6(1):2. doi: 10.1186/2040-7378-6-2.

4. Pan'kiv VI. Cukrovij diabet, pereddiabet i sercevo-sudinni zahvorjuvannja. Praktichna angiologija. 2007;1(6):4-10.

5. Voloshin PV, Mishhenko TS, Dmitrieva OV. Sudinna demencija. Mistectvo likuvannja. 2004;5(11):36-9.

6. Kulikova AN. Rol' vospalenija v aterogeneze pri saharnom diabete (obzor literatury). Citokiny i vospalenie. 2007;(3):115-9.

DDC-UDC 577.118+616-092.9+616.441-008.61S

DOI:10.19221/201742

Guranych S.P., Voronych-Semchenko N.M., Guranych T.V.

Department of Physiology SHEE "Ivano-Frankivsk National Medical University", Ivano-Frankivsk, Ukraine, quranichtanja@ukr.net

MACRO- AND MICROELEMENT STATUS OF RATS WITH INSULIN RESISTANCE AGAINST THE GROUND OF IODINE DEFICIENCY

Abstract. Combined endocrine pathology and insulin resistance (IR) against the ground of iodine deficiency (ID) in particular, causes disorders of metabolic processes of the organism and mineral homeostasis. That's why the objective of the research was the examination of changes of macro- and microelements status of rats with IR against the ground of ID. ID and IR were found to lead to the reduction of calcium and magnesium content in the teeth and alveolar processes tissues. During the combination of these experimental conditions the redistribution of macroelements between the examined tissues was observed. In particular, against the ground of hypercalcemia and hypermagnesemia decrease of these elements content in the teeth and alveolar processes. Thus, IR against the ground of ID leads to the disruption of the mineral composition of the hard tissues of teeth and bones and is a risk factor for the development of dental pathology.

Key words: insulin resistance, iodine deficiency, mineral status, dentomaxillary system.

Introduction. Pathology of the endocrine glands belongs to one of the most spread diseases with a tendency to increase. Combination of endocrine nosologies is especially several dangerous in a prognostic aspect. In particular, cases of insulin resistance syndrome against the ground of iodine deficiency (ID) occur more frequently. It is connected both with genetic peculiarities of the population and deterioration of the ecological situation in the world. Under such conditions humoral homeostasis disorders stipulate changes of the structural-functional state of many organs and systems, and dentomaxillary as well [3]. Depolymerization of the bone organic matrix, disorders of collagen formation. osteoclast activation against osteoblast apoptosis and mineral imbalance occurring under conditions of insulin resistance (IR) promote disorders of the osteosythetic processes [1].

Objective: to determine changes of macro- and microelement status of rats with IR against the ground of ID.

Materials and methods. The investigation was conducted on 90 male rats with the body weight of 150-180 g, divided into three groups: the rats with ID (the 1^{st} group, n=30); the rats with IR (the

 2^{nd} group, n=30); the rats with IR against ID (the 3^{rd} group, n=30). ID condition was simulated by means of keeping the animals on iodine deficiency diet during 45 days [2]. IR was simulated by addition of 10% fructose solution to drinking water every day during 8 weeks [6]. Euthanasia was made by means of decapitation under ketamine narcosis (100 mg/kg of the body weight). Macro- and microelement status of the rats was characterized by the level of calcium, magnesium, zinc, manganese and copper in the packed red cells, teeth and alveolar processes by means of the atom-adsorption spectrophotometry method. The activity of alkali and acid phosphatase were detected in the blood serum. For the sake of comparison similar examinations were performed on 30 intact animals (the control group) kept under conditions of standard diet, usual temperature and light regimen in the vivarium. Quantitative results of the study were analyzed by means of the package of mathematic programs StatisticSoft 7,0.

Results and discussion. In the rats with ID the amount of calcium and magnesium was found to be 71,1-97,5% (p<0,05) and 81,2-95,5% (p<0,001) down respectively in all the examined tissues as compared to the animals from the control group (Table 1).

Table 1

The content of macro- and microelements in the packed red cells, teeth and alveolar processes of rats with iodine deficiency, insulin resistance and insulin resistance against the ground of iodine deficiency (M+m)

Groups of	Calcium,	Magnesium,	Zinc, mcg/ml	Manganese,	Copper,
animals	mg/L	mcg/ml		mcg/ml	mcg/ml
		Packed re	ed cells		
Intact animals	0,8±0,29	45,26±14,96	5,17±2,40	0,14±0,05	1,79±0,93
(n=30)					
1 st group	0,02±0,01*	2,06±0,41 ^{##}	2,65±0,92	0,06±0,03	4,25±1,32
(ID, n=30)					
2 nd group	0,04±0,02*	2,08±1,68 ^{##}	4,03±1,43	0,1±0,07	2,13±1,1
(IR, n=30)					
3 rd group	0,74±0,28	36,09±2,88 ^{##}	4,19±1,73	0,02±0,01*	1,63±0,75
(IR against ID,	p ₁₋₃ <0,05	p ₁₋₃ <0,001		p ₂₋₃ <0,001	
n=30)	p ₂₋₃ <0,05	p ₂₋₃ <0,001			
		Teet	h		
Intact animals	59,75±3,98	3195,56±253,23	44,46±7,77	10,89±2,00	3,92±1,33
(n=30)					
1 st group	17,28±1,18 ^{##}	600,00±44,38 ^{##}	67,89±12,98	4,22±1,64*	7,05±2,20
(ID, n=30)					
2 nd group	18,20±0,60 ^{##}	772,50±68,40 ^{##}	64,18±5,76*	3,18±1,46*	6,03±0,97
(IR, n=30)					
3 rd group	12,19±1,05 ^{##}	375,00±40,20##	78,85±6,19 [#]	1,71±0,69 [#]	5,94±1,54
(IR against ID,	p ₁₋₃ <0,01	p ₁₋₃ <0,01			
n=30)	p ₂₋₃ <0,01	p ₂₋₃ <0,01			
Alveolar processes					
Intact animals	61,99±11,63	1689,00±241,54	122,89±58,57	1,21±0,47	3,29±1,08
(n=30)					
1 st group	17,40±0,64**	215,21±30,90 ^{##}	76,65±11,27	5,10±1,27	4,32±1,06
(ID, n=30)					
2 nd group	16,21±0,70**	174,40±37,99 ^{##}	123,36±31,97	3,81±1,43	4,40±1,92
(IR, n=30)					
3 rd group	10,83±1,76**	172,00±30,03	72,97±11,71	2,04±1,52	5,57±1,51
(IR against ID,	p ₁₋₃ <0,01	p ₁₋₃ <0,01			
n=30)	p ₂₋₃ <0,05				

Notes: * - p < 0.05; ** - p < 0.02; # - p < 0.01; # - p < 0.01 concerning similar indices in the control group of animals; p - reliable difference between the indices of the appropriate experimental groups.

Similar tendency was detected in animals with IR which amount of calcium and magnesium became 69,5-95,0% (p<0,05) and 75,8-95,4% (p<0,001) down respectively in comparison with the similar indices of the intact rats (Table 1). In animals with IR against the ground of ID redistribution of macro- and microelements in he examined tissues was found. Thus, in the packed red cells, teeth and alveolar processes of rats from the 3rd group the content of the majority of macro- and microelements became 20,3-88,3% (p<0,05)

lower than that of the control. At the same time, the content of zinc in the dental tissues became 44,4% (p<0,05) higher than that of the initial data. It can be indicative of a compensatory supplement of calcium and magnesium content in the structure of the teeth by this element, as zinc is known to participate in cell division forming dentin [5].

In case of comparative analysis of the indices of the 1st and 3rd groups different changes of macroelements in the examined tissues were found. Thus, in the packed red cells of animals with IR against the ground of ID a considerable increase of calcium and magnesium concentration was found as concerning the indices of rats with ID. On the contrary, in the tissue of the teeth and alveolar processes the content of these elements became 20,1-37,8% (p₁₋₃<0,01) lower as compared to the similar indices of animals from the 1st group (Table 1). Certain literary evidence suggests that under conditions of acidosis occurring in case of hyperglycemia, a relative hypercalcemia is found, as calcium ionization intensifies and the percentage of its active form in the blood increases. At the same time, compensatory elimination of calcium from the teeth and bones increases in exchange for carbon ions [4].

The comparative analysis of indices from the 2^{nd} and 3^{rd} groups detected different changes of the examined parameters. For example, in the packed red cells of rats with IR against ID the content of calcium and magnesium increased in 18,5 times (p₂₋₃<0,05) and 17,4 times (p₂₋₃<0,001) with simultaneous 80,0% (p₂₋₃<0,001) reduction of manganese as concerned the similar indices in the animals of the 2^{nd} group. At the same time, the level of macro-elements in the tissue of the teeth and alveolar processes became 33,02-51,5% (p₂₋₃<0,05) lower as compared to the appropriate indices of rats with IR (Table 1).

An increased activity of acid phosphatase (AP) in the blood serum of the experimental animals evidences changes of calcium homeostasis (Table 2). Thus, in rats with ID this index became 37,2% (p<0,05) higher as compared to the control data. In animals of the 2nd group AP activity was twice as much (p<0,01) as compared to the initial indices. Combination of IR and ID was associated with more pronounced activation of the enzyme (in 2,4 times, p<0,001) as compared to the appropriate indices of the intact rats, which is indicative of intensification of osteo-resorptive processes under given experimental conditions. The comparative analysis of AP activity of animals from the 1st and 2nd groups indicates that this index becomes 43,4% (p₁₋₂<0,05) up. This tendency is indicative of the fact that under conditions of IR changes of the mineral content of the bone are more pronounced. The similar tendency was detected in the blood serum of rats with IR against ID where AP activity became 69,9% $(p_{1-3}<0,001)$ and 18,5% $(p_{2-3}<0,05)$ higher as compared to the similar indices of animals from the 1st and 2nd groups.

Table 2.

Activity of alkali and acid phosphatase in the blood serum of rats with iodine deficiency (ID), insulin resistance (IR), and insulin resistance against the ground of iodine deficiency (M±m)

Groups of	Alkali	Acid	
animals	phosphatase,	phosphatase,	
	mcct/L	units/L	
Intact	4848,89±1622,16	2,59±0,30	
animals			
(n=30)			
1 st group	2813,60±488,19	3,69±0,71*	
(ID, n=30)			
2 nd group	4174,91±1907,65	5,29±0,93 [#]	
(IR, n=30)		p ₁₋₂ <0,05	
3 rd group	4855,50±1549,00	6,27±1,69 ^{##}	
(IR against	p ₁₋₃ <0,01	p ₁₋₃ <0,001	
ID, n=30)		p ₂₋₃ <0,05	

Notes: *-p<0.05; #-p<0.01; ##-p<0.01 concerning similar indices in animals of the control group; p – reliable difference between the indices of the appropriate experimental groups.

Conclusions. Metabolic changes occurring under conditions of iodine deficiency and hyperglycemia result in disorders of macro- and microelement homeostasis of the body tissues. The structural organization of the teeth and bones reacts to such humoral disorders most of all which is manifested by reduced depot of calcium, magnesium and manganese in them. These changes prove the activation of osteoclasts against the ground of inhibition of osteosynthetic processes. Under conditions of combined IR and the mineral status experiences more ID pronounced changes and are associated with redistribution of macro-elements. This tendency produces a negative effect on metabolism of the hard periodontal tissues, and it can result in the development of degenerative-dystrophic disorders in them.

Prospects of further studies. The results obtained can be the basis to conduct clinical observations with the purpose to use the data of the blood serum phosphatase as a marker of diseases of the osseous tissue against the ground of endocrine disorders including dental pathology.

References:

1. Antonishin IV, Marushhak MI, Gabor GG. Osoblivosti makro- i mikroelementnogo skladu tverdih tkanin zubiv pri eksperimental'nomu alimentarnomu ozhirinni. Ukraïns'kij stomatologichnij al'manah. 2015;(1):16-9.

2. Voronich-Semchenko NM, Guranich TV. Zmini procesiv vil'noradikal'nogo okisnennja lipidiv ta bilkiv, antioksidantnogo zahistu u shhuriv iz gipofunkcieju shhitopodibnoï zalozi na tli deficitu jodu ta midi. Fiziologichnij zhurnal. 2014;60(4):30-39.

3. Vohminceva LV. Rymar' SS, Majanskaja NN. Funkcional'naja aktivnost' nejtrofilov u krys s vospalitel'nym processom v parodonte na fone ponizhennoj funkcii shhitovidnoj zhelezy.

Stomatologija. 2009;(2):4-7.

4. Davidenko SV, Neporadna KS. Patologichni zmini v kistkovij tkanini parodonta shhuriv iz eksperimental'noju virazkoju shlunka ta cukrovim diabetom. Ukraïns'kij stomatologichnij al'manah. 2009;(2):3-5.

5. Pogrebnjak GV. Stan al'veoljarnoï kistki i jasenevoï tkanini u samic' shhuriv za umov nezbalansovanih racioniv goduvannja. Svit medicini ta biologiï. 2015;54(4):134-8.

6. Shuprovich AA, Gurina NM, Korpacheva-Zinich OV. Porushennja obminu sechovoï kisloti u shhuriv z eksperimental'nim insulinorezistentnim sindromom, indukovanim fruktozoju. Fiziologichnij zhurnal. 2011;57(1):72-81. DDC-UDC 618.33-02:618.39.-021.3.

DOI:10.19221/201743

Fedyshyn T.V.,

Ivano-Frankivsk City Perinatal Center, Ukraine, MVitV1975@ukr.net

Maliar V.V.,

PhD, Associate Professor, Chair of Obstetrics and Gynecology, SHEE "Uzhhorod National University", Uzhgorod, Ukraine, MVitV1975@ukr.net

Maliar V.A.

PhD, Associate Professor, Chair of Obstetrics and Gynecology, SHEE "Uzhhorod National University", Uzhgorod, MVitV1975@ukr.net

PECULIARITIES OF UTERO-PLACENTAL BLOOD CIRCULATION FORMATION IN WOMEN WITH SPONTANEOUS AND RECURRENT MISCARRIAGES ASSOCIATED WITH VAGINA DYSBIOSIS

Abstract. Forming of utero-placental blood flow is analysed for women at the early losses of pregnancies in anamnesis on a background a dysbiosis vagina which has a high predictive value on the preclinicaly stage of diagnosticating of primary disfunction of placenta on a background violation of microbiocenosis of vagina.

Keywords: pregnancy, gestational alteration, dysbiosis.

Introduction. Clinical picture of miscarriages at early stages is diverse, one of the special diagnostic criteria is the increased tone of the uterus and disturbance of placental flow [1, 2, 5].

It is believed that one of the leading pathogenetic factors of the "early pregnancy loss syndrome" against the background of vaginal dysbiosis is the disturbance of hemodynamic processes in a single functional biosystem mother-placenta-fetus [3, 4].

Therefore, it is relevant to search for noninvasive methods for diagnosis of disorders of the microcircular channel reorganization in the uterine artery pool.

Objective: determining the diagnostic and prognostic significance of dopplerometry in evaluating the gestational reorganization of endometrial segments of the spiral arteries of the uterus in women with spontaneous and recurrent miscarriage associated with vaginal dysbiosis in anamnesis.

Material and methods. In order to clarify the role of the infectious agent in the genesis of the "early pregnancy loss syndrome", the study was conducted in two representative groups: 50 pregnant women with spontaneous abortion and associated vaginal dysbiosis in anamnesis (group I), and 50 women with recurrent miscarriage against the background of vaginal dysbiosis (group II).

The control group consisted of 50 primigravida women with normal pregnancy. Ultrasound examination of the preplacental blood flow was performed on the "Toshiba SAH – 38 AS" machine. Blood flow assessment was carried out by determining the systole-diastolic S/D ratio, pulsation index (PI), and resistance index (RI).

The morphofunctional transformation of the endometrial segments of the spiral arteries (SA) was studied in the biopsy material of the placental bed of the uterus, obtained by means of the acute incurvate curette "Medintechinvest CJSC", tissue samplings were fixed in 10% neutral formalin solution, and after dehydration in the graded alcohols of increasing concentration they were poured into paraffin, there were made the sections of 7-8 microns in thickness, stained with hematoxylin and eosin and examined in a light microscope MBI-3.

Microphotography was performed with the help of digital camera Sony DSH-HS, 7.2 Mpx.

The calculation of the results was carried out by means of the method of variation statistics using the statistical package "STATISTICA 7.0".

Results and discussion. The research has shown that attention should be drawn to the dopplerometric exploration of the blood flow during the 10-11th week of pregnancy in the uterine artery (UtA) pool; it has revealed the presence of high preplacental resistance in the

Table

	in the groups under s	ituuy (ivi±iii)		
Groups of pregnant women	Dopplerometric indices			
	S/D	PI	RI	
l group (10–11 weeks)	9,47±0,04 [×]	1,48±0,05 [×]	0,71±0,02 [×]	
II group (10–11 weeks)	9,46±0,06 [×]	1,82±0,05 [×]	0,76±0,06 [×]	
Control group (10–11 weeks)	8,03±0,04	1,32±0,04	0,61±0,02	

Dopplerometric indices in the pool of dominant uterine artery (UtA) in the groups under study (M±m)

Note: ^{*x*}*p* (< 0,05) – *in comparison with control group*

blood stream in 20 women (40.0%) of group I and in 32 women (64.0%) of group II (Table), indicating a delay in the formation of low-resistance blood flow in the UtA.Thus, in pregnant women with spontaneous miscarriages (group I) during the 10-11th weeks of pregnancy dopplerometric indices were: S/D - 9.47±0.04; PI - 1.48±0,05; RI -0.71±0.02 (p<0.05). In pregnant women with miscarriage the recurrent (group II), corresponding indices were respectively: S/D -9.46±0.06; PI – 1.82±0.05; RI – 0.76±0.06 (p<0.05). There is no significant difference between the first and the second group.

At the same time, in both groups on the dopplerograms of blood flow velocity curve, a decrease in the diastolic component was recorded (Fig. 1). In some cases, especially at the recurrent miscarriage, there were pathological blood flow velocity curves in the pool of dominant UtA, the termination or reversal of the blood flow into the diastole phase in certain cycles.

In pregnant women against the background of miscarriages color Doppler mapping demonstrated that in the area of myometrium hypertonia, a disturbance in the bloodflow is observed in the form of low color mapping of the uterine wall (Fig. 2).



Fig. 1. 10-11 weeks of pregnancy. The threat of miscarriage. Dopplergram of blood flow velocity curve in the dominant circulation of UtA. Decrease of diastolic component.



Fig. 2. 10-11 weeks of pregnancy. The threat of miscarriage. Color Doppler mapping. Low color mapping of the uterine wall in the area of myometrium hypertonum.

In addition, the ultrasound investigation revealed several thickenings of myometrium, including the placentation region. In some cases, in the placental site, there was a partial detachment of the placenta on a small area. Between placenta and myometrium hematoma was visualized in the form of a flattened echo negative element (Fig. 3).

It is known that the cause of early reproductive loss of pregnancy may be a delayed gestational reorganization of SA against the background of infectious pathogens [2].



Fig. 3. 11–12 weeks of pregnancy. The threat of miscarriage. Premature detachment. The retroplascent hematoma (longitudinal scan) is echographically visualized.

Morphological studies of the biopsy material of the placental bed of the uterus indicate that there is no loss of muscle-elastic structures of the SA, indicating a delayed gestational restoration of the endometrial part of the SA in the utero-placental artery (Fig. 4).



Fig. 4. 10-11 weeks of pregnancy. Spontaneous miscarriage. Delayed gestational transformation of the endometrial part of the SA in the utero-placental artery. Staining with hematoxylin-eosin. Fig.: vol.x10, ca.x15.

1) preserved in vessels endothelial and smooth muscle elements;

2) vessel lumens are narrow, slit-like.

Conclusion. Thus, studies have shown that in women with early pregnancy loss in the anamnesis against the background of vaginal dysbiosis there is a delay in the gestational restoration of endometrial segments of the spiral

uterine arteries, that negatively affects the placenta.

Prospects for further research. There is no doubt about the need for further study and analysis of the status of utero-placental-fetal blood circulation in women with "early pregnancy loss syndrome" against the background of vaginal dysbiosis, which would improve the effects of gestation.

References:

1. Krasnopol'skij VI, Tumanov VA, Titchenko LI. Vozmozhnosti prognozirovanija oslozhnenij beremennosti pri doplerometrii v I trimestre gestacii. Rossijskij vestnik akushera-ginekologa. 2003; (3):5-9.

2. Sidel'nikova VM. Privychnaja poterja beremennosti. M: Triada–H; 2005. – 304 p.

3. Bukhari SS, Livesy S. Urinary tract infection: Hresentation and Diagnosis Med Progress. 2000;(1):10-4.

4. Leitich H, Braunbauer M. Bacterial vaginosis as a risk factor for preterm delivery: a meta-analysis. Am J Obstet Gynecol. 2003;189:139-1.

5. Langer B, Gandinean A, Sananes N, Pritz G. Management of patients with a history of late abortion or very premature delivery. Gynecol Obstet Fertil. 2013; 41(2):123-9. DDC-UDC 611.321.013-053.13

DOI:10.19221/201744

Rusnak V.F.,

Assistant, N.H. Turkevych Department of human anatomy of the Higher State Educational Institution of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine

Bedyk V.V.

Department of Surgical and Pediatric Stomatology, Higher State Educational Institution of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine

GROWTH OF THE PHARYNX AT THE END OF THE FETAL STAGE OF HUMAN ONTOGENESIS

Abstract. On the basis of the morphological methods of research, the topographic and anatomical relationship between the pharynx and adjacent formations in human embryos has been studied and consistently analyzed. Skeletopia of the pharynx is closely related to the nasal and oral cavity, the palate, throat, and esophagus. It has been established that in the dynamics of the overall pharyngeal formation a craniocaudal gradient of development is observed, where the caudal limit is gradually shifting along the vertical axis throughout the embryonic period.

Key words: pharynx, embryo, human, ontogenesis.

Introduction. The formation of syntopical relationships and the development of organs in different ages attracts special attention of modern embryologists, anatomists, and clinicians [1]. Scientists always have guestions about the insufficient number of scientific developments in the study of the development of organs in the normal and pathology [2]. An in-depth study of the development of thoracic topography for specialists in many branches of medicine is an urgent task [3]. Syntopical correlation and mechanisms of ontogenetic processes are an aspect of understanding the foundations of the formation of an organ, the formation of its topography, variants of the structure and development of various defects [4]. It is indisputable that the onset of various anomalies, that occur in clinical practice, can only be explained by a clear understanding of the embryonic process of the origin and the interaction of certain organs and structures [5], which requires a thorough study of normal and pathological development of the fetus for the further development of algorithms and antenatal aspects of health protection [6].

Objective. To study the topographicanatomical relationship of the pharynx and adjacent structures at the end of the embryonic stage of human ontogenesis.

Material and methods. The research was conducted on specimens of 16 corpses of human

embryos using histological, macro-, microscopic methods, plastic and graphic reconstructions and morphometry.

Results and discussion. In the embryos with 9.0-10.5 mm of the crown-rump length (CRL) (beginning of the sixth week of fetal development), the longitudinal size of the pharynx rudiment is 363-372 microns, the width of the lumen on the sagittal cut is 122μ m on average.

The entire primary cavity of the mouth is occupied by a bulky tongue in which it is easy to distinguish the side rolls and the unpaired middle tubercle.

Pharyngeal openings of the auditory tubes are funnel-shaped and their diameter reaches 4.7 - 5.2 μ m.

In the caudal part of the anterior wall of the pharynx, at the point of branching of the tracheopulmonary rudiment, there is a thickening of the mesenchyma in the form of arytenoid and transverse rolls that separate the entrance to the respiratory tube. In this way the process of forming the larynx begins and the differentiation of the pharyngeal part of the thrombosis, which is associated with it, and therefore, one can speak of the emergence of a quite clear limit between the oral and the laryngeal parts of the organ.

The lumen of the pharyngeal rudiment is lined with a two-layer cylindrical epithelium. In the embryo with 10.5 mm of CRL, the cell height increases and reaches 11 - 14 microns. Epithelial cell nuclei are still located at different levels.

In the areas adjacent to the epithelial layer of the pharynx, cells of the mesenchyma are located more compactly than in its peripheral parts, where they merge with the mesenchyma of adjacent organs without a sharp bound. The thickness of this more compact mesenchymal layer reaches an average of 19 - 22 microns. The nuclei of mesenchymal cells are oval and located at different levels.

More dorsally to the pharynx the spine is located which is separated from the pharynx with a thin layer of mesenchyma 17-20 microns thick, more ventrally there is a larynx rudiment, behind the pharynx the basilar artery passes, and ventrolaterally, between the pharynx and the rudiment of the respiratory system, lies the neurovascular bundle of the neck. The vagus nerve is massive, its diameter is almost equal to the diameter of the intestinal tube. After the rudiments of various organs are formed the pharyngeal mesenchyma forms а loose connective tissue, which surrounds the blood vessels and nerves. In the embryonic period of development the vessels and nerves are gradually shifting more medially, thus approaching the lateral wall of the pharynx.

While studying the series of histological sections of embryos with 12,0 - 14,0 mm of CRL (the end of the sixth week of intrauterine development) and plastic wax reconstructive model of the primary oral and nasal cavities of an embryo with 14,0 mm of CRL, it was established that the length of the pharynx rudiment is 443-475 microns. The width of the lumen is on average 62 microns. Moreover, the shape of the lumen throughout the embryo growth is not the same because of the further development of the anlage of the tongue and the rudiment of the larynx.

The epithelium, which lines the lumen of the pharynx rudiment, at the end of the embryonic development period, is three-layer and cylindrical, with a thickness of 13-16 microns. Cell nuclei sized 5-7 microns are circular or elongated and occupy a predominantly apical position, although in general they are placed on three levels. Around the epithelium of the pharyngeal gland there is a much higher concentration of mesenchymal cells. The thickness of the pharynx rudiment walls is on average identical throughout and reaches 113-

122 microns. The mucous layer is 21-25 μm. Outside of the mucous membrane rudiment there is a thick layer of mesenchymal tissue, which does not differ in structure from that of organs adjacent to the pharynx. The same layer of mesenchyma, which separates the posterior wall of the pharynx from the spine, becomes somewhat thinner compared to the similar layer of mesenchyma in the rudiments of 9.0 - 10.5 mm CRL. The vault of the pharynx borders with the rudiment of the base of the skull.

At the end of the embryonic period (embryos with 12,5 - 14,0 mm of CRL) there is a breakthrough of the nasal chambers into the primary oral cavity, resulting in the connection between the primary cavities of the nose and mouth.

The massive tongue is located quite high and thus closes the opening that leads to the airways. In the thick of the tongue there are muscular fibers, going in different directions.

Studying the plastic reconstructive model of the primary oral and nasal cavities of the embryo with 13.5 mm of CRL showed that the two halves of the primary nasal cavity are curve-shaped, that is, they are initially directed dorsally, and then somewhat caudally - in the direction of the primary oral cavity and open at its lateral walls. The anterior-posterior size of the primary nasal cavity is 676 - 688 μ m.

The rudiment of the larynx, represented by thickening of the mesenchyma and located directly at the entrance to the respiratory tube, indicates the caudal border of the pharynx and corresponds to the level of the third cervical vertebra.

A distinctive feature is a funnel-shaped depression on the dorsal wall in the extreme caudal section of the pharynx rudiment, which is lined with a three-layer epithelium. Its depth reaches 11 - 13 microns, the distance between the edges on the sagittal cut is 25-26 microns.

Conclusion. In the embryonic developmental period, all parts of the pharynx are not completely formed due to the absence of a secondary palate that separates the secondary nasal cavity from the oral cavity, as well as because of the insufficiently clear separation of the larynx rudiment from that of the pharynx and the latter from adjacent structures, since they are surrounded by the

commonl layer of mesenchyme.

Prospects of further research. It is rational to study the topography and anatomical relationships of the pharynx with adjacent structures in different age periods of ontogenesis for the possibility of studying the occurrence of individual morphological changes and pathological variations in clinical practice.

References:

1. Gorbunov NS, Mishanina MN. editors. Aktual'nye problemy morfologii: sb nauch tr. Krasnojarsk: KrasGMA; 2004.

2. Burih MP, Ahtemijchuk JuT. Suchasni pidhodi shhodo vivchennja budovi ljudini ta klinichna anatomija. Klin anat ta oper hirurgija. 2002;1(1).

3. Sieroszewski P, Suzin J, Bas-Budecka E. Diagnostic methods for fetal malformations in the

first half of pregnancy. Ginekol pol. 2003; 74(10):1276-83.

4. Galagan VO, Timchenko OI. Efektivnist' prenatal'noï diagnostiki prirodzhenoï patologiï sered vagitnih Kieva. Pediatrija, akusherstvo ta ginekol. 2005; (4):21-4.

5. Popeljuk O.-M.V. In: Okolokulak ES, editor. Razvitie hrjashhej gortani cheloveka v predplodnom periode. Sb. trudov Mezhdunar. nauch.-prakt. konf. posv. 50-letiju kaf. anatomii cheloveka GrGMU. Aktual'nye voprosy morfologii. Grodno; 2008.

6. Doklad o sostojanii zdravoohranenija v mire. Sovmestnaja rabota na blago zdorov'ja. VOOZ; 2006. 1-19. DDC-UDC 611.77:611.976]-013-018

Teplytskyi S.S.

Department of general surgery of the Baruch Padeh, Poria Medical Centre, Lower Galilee, Israel

FORMATION AND DEVELOPMENT OF THE SKIN ON THE PALMAR SURFACE OF THE HAND THROUGHOUT THE PERIOD OF PRENATAL ONTOGENESIS AND ITS IMPORTANCE IN DERMATOGLYPHICS

Abstract. The review article deals with a topical issue of hand skin morphogenesis in the early period of human ontogenesis, it highlights the stages of formation and development of the palmar skin of the hand and its significance in dermatoglyphics.

Key words: morphogenesis, prenatal ontogenesis, skin, palmar surface of the hand, dermatoglyphics.

According to E. I. Danilova (1979), man does not have an organ like the hand that would possess such a wide range of functional capabilities at once and would perfectly combine such a significant force, great tactile sensitivity, virtuosic dexterity and ability to the finest manipulations that are performed by the fingers [4].

Despite a huge number of morphological studies, even today the question arises: what is the morphological basis of the highly developed multifunctional human hand and what are its morphofunctional elements? Answers to these questions can be given by morphological and comparative anatomical studies of the development of the hand throughout the entire prenatal ontogenesis, from the anlage to the birth of the child.

Looking through the foreign and domestic literature [2,4,7,9,11,13-15,19,20,23] testifies that, despite a relatively large number of works devoted to the study of the morphogenesis of the human hand, only some works are based on the study of its morphology in different age periods of prenatal ontogenesis.

Most reports indicate that the anlage of the upper limb in humans appears in embryos of 4.0-5.0 mm of the crown-rump length (CRL) in the form of crests of the trunk on the site, that is, 6 somites [14, 16]. In this stage of the anlage the hand that looks like a bud, is represented by a non-differentiated layer of the mesenchyme covered by epithelium, which forms the outer layer of the skin, or the epidermis. At the 6th week (embryos 13.5-14.0 mm CRL) of the embryonic development, the anlage of the hand resembles a shovel or an oar and connects to the trunk with a wide isthmus. The prefetuses aged 7 (17.0-20.0 mm of the CRL), have the rudiments of the fingers in the form of five protuberances, which are connected by bridges. At the end of the 8th week the pre-fetuses' (25.0-27.0 mm of CRL) fingers are lengthened and separated, their differentiation is completed. The crest skin of the human body is formed in the fetal period in the 3rd to 6th months of intrauterine development (K.A. Kalantaevskaya, 1972, I.S. Guseva, 1986). A twomonth fetus has blood vessels of the skin deep network. In the beginning, according to a number of authors [1, 3, 11, 14, 16, 24], all epithelial coverings of the skin of the upper limb rudiment, as well as other areas of the embryo body, are represented by a single layer of cubic cells with clearly placed nuclei. At the end of the 4th week (5.0-6.0 mm CRL) it becomes prismatic [2], and in embryos with 7.0-9.0 mm CRL it consists of two layers due to the fact that some prismatic epithelial cells begin to protrude towards the surface forming a thin layer of flat cells - periderm, which performs a protective function, keeping the skin from maceration with an amniotic fluid [10,16]. According to Yu.N. Shapovalov (1983), in the embryos of the 6th week (9.0-11.0 mm of TCD), the epithelium is thickened at the apex of the rudiment of the upper extremity and is represented by 4 layers of cells [2, 3].

By the end of the 8th week (21.0-30.0 mm of CRL), the skin epithelium begins to thicken due to the displacement of nuclei and the redistribution of the cells of the Malpighian layer. Thus, there is a third - an intermediate layer, which is located between the flat cells of the periderm and the

basal layer, which borders on the skin. The cells of the intermediate layer begin to elongate and become markedly vacuolated.

During the 9-12th weeks (311-80.0 mm CRL), the basal layer of cells begins to differ sharply from the remaining layers of the epithelium. These cells, continuously multiplying, form a germinative layer, which ensures the growth of the entire epidermis.

During the 13-16th weeks (81.0-200.0 mm CRL), the epithelium becomes multilayered and approaches its definitive structure.

At the 17-19th weeks of embryonic development the process of keratinization begins, which is accompanied by the formation of a typical granular layer. The fetus with 240.0 mm CRL has epidermis of the skin of the fingers with clearly expressed keratinization.

At the end of the 28th week the epithelium of the hand skin, contains already all layers of cells that are characteristic for fully developed skin:

- the stratum corneum proper formed by horny scales;

- the shiny layer with the inclusion of elendin;

- the granular layer, in the cells of which one can see the grains of keratogialin;

- A layer of spiky cells with pronounced intercellular bridges;

- the basal layer, which manifests itself by basophilia of the cellular cytoplasm [8, 11, 13, 14].

The skin, or corium, which is developing, consists of a densely woven layer of fibrous connective tissue that is located directly under the epidermis. It is formed from the mesenchyme of the cells that migrate from dermatomes located under the ectoderm (partly from the parietal sheet of the splanchnotome) [14-16]. In its differentiation, the main dependence on the differentiation of the epithelium, which covers it, is expected. During the 20-23rd weeks, the amount of collagen fibers of the skin increases significantly, especially in the palms of the hands, where they begin to be placed in bundles. In fetuses of 200.0 mm of CRL there no bundles in the fluffy connective tissue, which closes the terminal sections of sweat glands.

In the early stages of skin development (4-9th weeks), the junction of the epithelium and connective tissue remains smooth. However, during the 13-16th weeks, when the epithelium

thickens, its internal surface becomes uneven, forming ridges and cavities, which are filled with the connective tissue. By the 19-20th weeks these structures are transformed into very complex designs, which are well traced on fingerprints and form a unique and individual pattern for each person. In addition to these furrows, the skin on the palms contains local elevations of the corium (dermis) corresponding to small depressions on the inner surface of the epithelium. Such connective tissue protrusions are called dermal papillae [18].

Having analyzed a large number of scientific works, I.S. Guseva (1986), identified three main stages in the formation of crested human skin:

1. The preparatory stage, which is characterized by the formation of predisposition to crest formation and preparation for the "launch" of genes. This stage lasts from the end of the 8th to the beginning of the 10th week of embryogenesis.

2. The stage of crest formation and formation of types of papillary patterns. At the 10-11th week of embryonic development, the genes responsible for the formation of crested skin (its specific details and surface relief) join in the work. The stage lasts until 22-24th weeks of intrauterine development of the fetus. By this time the relief of the skin reaches its final maturity.

3. The stage of maturing the crested skin: begins with the 24th week of development of the fetus and finishes with the birth. At this stage the crested skin matures as a tactile organ, a strong protective horny layer is formed. Consequently, by the birth of a child, its crested skin is formed to tactile perceptions.

Thus, the morphogenesis of the skin of the hand and its palmar surface in the early period of ontogeny of the human body has its own peculiarities. For instance, the anlage of the upper limb in a man begins on the 4-5th weeks of the prenatal period, and the formation of the skin of the hand and its palmar surface begins at the 6th week from the non-differentiated mesenchyme covered with epithelium, which consists of one layer of cubic cells. In the same period of the development of the embryo, when the hand resembles a wide jagged blade, there are volar elevations in the regions of II, III and IV interphalangeal spaces. Volar elevations are the

zones on which the papillary pattern will be formed. The third through sixth months of embryonic development are a period of intense cristae formation, in particular maturation of the epidermis and dermis. In the dermis, the papillary and reticular layers are formed. Dermal papillae form against the background of intensive growth of the papillae of the epidermis - the rudiments of the ducts of the sweat glands. By the 15-17th weeks, the formation of the crests is spread over the entire finger-cushion. On the distal phalanges of the fingers of the fetus of this age, the types of patterns can be already differentiated. The patern begins to form from the central fragment and lateral rank, and only in the final stages delta appears. Later, the crested skin is formed as a Papillary patterns tactile organ. remain unchanged (I.S. Guseva, 1980).

In the 27-28th weeks of the fetal period, the skin epithelium already has all the layers of cells that are typical for fully developed skin. In addition, one can not underestimate the unrivaled importance of the skin structure of the palmar surface of the hand in criminalistics. The scientific basis for identifying a person by their hands is directly related to the anatomical features of the structure of the human skin. Individuality determines the uniqueness of the particular person's hand traces. Even in identical twins, the totality of details in the structure of skin patterns is never repeated. Over the last hundred years, no cases of coincidence of cutaneous patterns in different people have been revealed in world practice [5, 6, 17, 18, 21, 24, 25]. Moreover, the small features of papillary patterns create combinations - a macrostructure that is unique even on the fingers of the same person. Therefore, in identification, criminologists actively use not only the macrostructure of the papillary pattern, but the microstructure as well, expressed in the features of the structure of the papillary lines (edgescopy) and pores (poroscopy).

Another property of the skin of the fingers and palms of the hands is the ability to imprint on those objects to which the human hands touched. And the formation of prints occurs regardless of the will of a person, which is due to the physiological properties of the skin – the fact that the surface of the skin is always covered with secretions of sweat and fat. Moving when touched on an object, they form imprints on it, copying papillary patterns.

References:

1. Bocharov JuS. K voprosu ob embrional'nom razvitii kozhi cheloveka. In: Problemy sovremennoj embriologii. 11 Trudy soveshhanija biologov. 1953 jan 25. L: Izd- vo LTU; 1956. 104-7.

2. Brusilovskij AI, Georgievskaja LS, Savchuk BV, Shmatova TI, Tihonchuk JuS. Materialy k ocenke tempov gistogeneza proizvodnyh trjoh zarodyshevyh listkov v rannem jembriogeneze cheloveka. Soobshhenie 1: 4-5-ja nedelja razvitija. In: Voprosy morfologii v teoreticheskoj i klinicheskoj medicine. 11 Trudy Krymskogo med. in-ta. Simferopol' 1982; 91:53-61.

3. Brusilovskij AI, Georgievskaja LS, Savchuk BV, Shmatova TI, Tihonchuk JuS. Materialy k ocenke tempov gistogeneza proizvodiyh treh zarodyshevyh listkov v rannem jembriogensze cheloveka. (Soobshhenie II: 6-ja nedelja razvitija). Aktual'nye problemy morfogeneza i regeneracii 11 Trudy Krymskogo med in-ta. Simferopol'. 1983: (100). 49-64.

4. Gladkova TD. Kozhnye uzory kisti i stopy obez'jan i cheloveka. M: Nauka; 1988. P. 11-21, 69-80.

5. Guseva IS. Geneticheskie problemy v dermatoglifike [Avtoref. Dis. dokt. Biol. Nauk]. Minsk; 1980. – 38 p.

6. Guseva I.S. Morfogenez i genetika grebeshkovoj kozhi cheloveka. Minsk: Belarus; 1986. 158 p.

7. Danilova EI. Jevoljucija ruki. K: Vishha shkola; 1979. 368 p.

8. Eliseev VG, Afanas'ev Jul, Jurina IA. Gistologija. M: Medicina; 1983. 591 p.

9. 3ajcev GP. Mikroskopicheskaja anatomija kisti i pal'cev ruki. Arh pat anat i pat fiz. 1938; 2(4):93-9.

10. Kalantaevskaja KA, Morfologija i fiziologija kozhi cheloveka. K: Zdorov'e; 1972. 267 p.

11. Karlson B. Osnovy jembriologii po Pjettenu. M: Mir; 1983. p. 5-34.

12. Kovanov VV, Travina AA. Hirurgicheskaja anatomija konechnostej cheloveka. M: Medicina; 1983 490 p.

13. Potter EM. Topograficheskaja anatomija plodov, novorozhdennyh i detej rannego vozrasta. M: Medicina; 1971. 343 p.

14. Pjetten BM. Jembriologija cheloveka. M:

Medgiz; 1959. 612 p.

15. Stanek I. Jembriologija cheloveka. Bratislava: Veda izdat, Slovackoj AN; 1977. 440 p.

16. Falin LI. Embriologija cheloveka: Atlas. M: Medicina; 1976. 543 p.

17. Sharec JuD, Dermatoglifika v medicine. Medicinskaja konsul'tacija. 1999; (3):12-9.

18. Bonnevie K. was Lehr die Embryologie der Papillarmuster uber ihre bedeutung als Russet – und Familiencharekter. Z Induct Abstammungs und Vererbur gslehre. 1929; 50:219-74.

19. Commins H. The topographic history of the volarpads (walking pads, Tastballen) in the Human Embryo. Centrex embryo. Carnegick Inst. Washington, 1929; 20:109-26.

20. Hale AR. Morphogenesis of volar skin in human fetus. Amer J Anat, 1952; 91:147-87.

21. Hamilton WI, Boyd ID, Mossman HW, Human embryology. Second Edition. Williams and Wilkins. Baltimore: 1957. P.118-144.

22. Marzke Mary W, Marzke RF. Evolution of the Human Hand: Approaches to Acquiring, Analyzing and Interpreting the Anatomical Evidence. J Anat 2000; 197:121-40.

23. Whipple II. The ventral surface of the Mammalian Chirid. Um, with especial reference to the conditions found in Man. Morfol U Anthrep. 1904; 7(1):261-8.

24. Wilder HH. On the disposition of the epidermic folds upon the palmsand soles of primates. Anat Ans. 1987;13:235-51.

25. Young, Richard W. Evolution of the Human Hand: the Role of Throwing and Clubbing. J Anat. 2003; 202(1):165-74. DDC-UDC 616.441-006.5-089-06-084

DOI:10.19221/201746

Tkachuk N.P.,

Post-graduate student, Department of Surgery No. 1, Higher State Educational Institution of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, kovalskan@ukr.net

Bilookyi V.V.,

Doctor of medical sciences, professor, Department of Surgery № 1, Higher State Educational Institution of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, slava.bilookyi@bsmu.edu.ua

Gyrla Ya.V.,

Candidate of medical sciences, assistant of the Department of Surgery №1, Higher State Educational Institution of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, yanas08@mail.ru

Sheremet M.I.

Candidate of medical sciences, associate professor of the Department of Surgery №1, Higher State Educational Institution of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, mihayl71@gmail.com

EVALUATING THE EFFICIENCY OF THE SCALE FOR PREDICTION OF POST-OPERATIONAL RELAPSE IN PATIENTS WITH NODULAR GOITERS

Abstract. The article analyzes the results of the examination and surgical treatment of patients with relapsing and non-recurring course of nodular forms of goiter in order to assess the prediction possibilities of the prognostic scale for the relapse of nodular forms of goiter. It has been established that the use of this scale allows identifying the groups of patients with a potential risk of recurrence of nodular forms of goiter in the preoperative period and to prevent recurrence of the disease in the postoperative stage.

Key words: risk of relapse, nodular goiter, prognostic factors, prognostication scale.

Introduction. Studies of recent years have shown an unceasing increase in the thyroid gland pathology in all countries of the world [1-4], and, due to this fact, the number of surgical interventions is increasing annually [5, 6].

Despite the progress of modern thyroid surgery, postoperative recurrence of goiter remains a rather common complication of thyroid gland surgery [7, 8]. According to various data, depending on the volume of the primary operation, the regional iodine deficiency and the duration of postoperative monitoring, from 0.3 to 80% [9, 10] of patients with the nodular forms of the disease are re-operated, due to a relapse of the disease.

It is difficult to establish a common chain of causative relationships in the development of postoperative recurrent nodular (multinodular) nontoxic goiter or to isolate the dominant factor among controversial literary facts based on the available data on the role of the directed effect of exogenous factors on the thyroid tissue and the human immune system [11, 12] Furthermore, the lack of a unified view of the etiology and factors of the development of relapse of nodular goiters

causes the lack of a unified prevention system [13-16].

Objective. To assess the prognostic possibilities of the prognostication scale that we developed to predict nodular goiter relapse.

Material and methods. We used the medical cards of patients with nodular goiters who were treated as inpatients in the surgical department of the Chernivtsi Regional Clinical Hospital during 2004-2016 as the material of a retrospective study. To achieve the homogeneity of the groups, the patients were selected according to the following criteria: histological women, confirmation of benign thyroid pathology. There were 40 persons who had been re-operated on a goiter relapse in the period from 2 to 10 years after the initial operation - the main (I, n = 40)group, and 60 patients with recurrence-free course of the disease for 14 years after the surgical intervention who were included in comparative (II, n = 60) group. In the analysis of these groups of patients, the data included in the prognostication scale of the risk of nodular forms of goiter relapse (No. 99332 UA) were taken into account. The evaluation was carried out according to the table based on the studied parameters (table 1) in patients included in the design of the study according to the arithmetic sum of the points. The maximum number on this scale is 9, the minimum is 0 points. The risk group consists of the patients with a score of \geq 5 points.

The clinical material of the prospective study included 60 patients with different forms of

goiter, operated from 2013 to 2014. The main (first) group was formed by 30 patients with nodular goiter, in which, when choosing the volume of surgery, the prognostication scale for the risk of recurrence of noduar forms of goiter was used, the comparative (the second) group involved 30 patients, whose operations were planned without using the scale.

Table

N⁰	Prognostication factor	Points	
1.	Living under the conditions of iodine deficiency	Yes – 1; No – 0	
2.	Sex	Female – 1; Male – 0	
3.	Age	< 50 years old- 1; > 50 years old- 0	
4.	Hereditary history of goiter	aggravated–1	
		non-aggravated – 0	
5.	Thyroid status	hypo, hyperthyroidism – 1	
	(Clinically and in laboratory)	euthyroidism – 0	
6.	Lesions in thyroid gland lobes	bilateral– 1;	
	(According to ultrasound findings)	unilateral – 0	
7.	Spread of lesion in the thyroid gland lobe (According	≥50% of the lobe – 1	
	to ultrasound findings)	< 50% of the lobe – 0	
8.	Echogenicity of perinodular tissue (According to	hypo-; hyperechogenicity – 1	
	ultrasound findings)	Isohogenicity – 0	
9.	Echo structure	Heterogeneous – 1	
		Homogeneous – 0	

The prognostication scale for the relapse of nodular goiters

All patients have undergone standard clinical (collection of complaints and anamnesis of the disease, physical examination), laboratory tests (general analysis of blood, urine, biochemical blood test, coagulogram, ionogram) and instrumental research methods (ultrasonography, FNAB).

Laboratory examinations were performed using the immunochemical method with electrochemiluminescent detection (ECLIA) using the Roche Diagnostics test system (Switzerland) and the ELISA assay for enzyme-linked immunosorbent assays.

Statistical data processing was carried out using the computer programs "Excel 7.0" and "Statgraphics Plus 5.1 Enterprise edition".

Results and discussion. Having analyzed the results of the examination of the medical records of inpatients in both groups with the prognostic scale, we found out that 90% of the patients in the main (I) group and 45% of the experimental (II) group belonged to the risk group for recurrence of nodular forms of goiter. It was also found that in

80% of patients in group I, surgical intervention was economical (subtotal resection of one lobe), whereas in 60% of patients in group II, haemi- or thyroidectomy was performed, depending on the localization of pathological structures.

To confirm the effectiveness of this scale application, we conducted a prospective study comparing the remote results of surgical treatment of patients with nodular forms of goiter. All patients in the first group, who, according to the prognostic scale, were in the risk group were performed expanded volumes of surgery: thyroidectomy, provided bilateral placement of nodes and hemithyroidectomy with subtotal resection of the contralateral lobe under condition of unilateral lesion. The patients who did not belong to the risk group, were performed less volumed surgical intervention, depending on the localization of nodular structures: unilateral hemithyroidectomy or subtotal resection of both lobes of the thyroid gland.

In the patients of the second group, surgical interventions were performed according to

generally accepted methods, depending on the type of changes in the thyroid tissue found during sonographic and scintigraphic examination.

Within two to three years after the performed surgical intervention, all patients were monitored for their thyroid status with its correction by substitution hormone therapy according to the generally accepted scheme, if necessary, and ultrasound examination of the thyroid gland. There was a relapse of the disease in two patients of the first group and 12 patients in the second group, during the observation.

Conclusions. The proposed scale is an effective method to predict the risk of recurrence of nodular forms of goiter whose advantages are the following: objectivity and ease of use, it does not require complicated research. It makes it possible to identify groups of patients with a potential risk of recurrence of nodular forms of goiter in the preoperative period and to prevent recurrence of the disease in these patients.

Prospects for further research. It would be appropriate to continue studying the possibilities to improve this method in order to increase the prognostication accuracy for nodular forms of goiter relapse.

References:

1. Chen AY, Bernet VJ, Carty SE, Davies TF, Ganly I, Inabnet WB, Shaha AR. American Thyroid Association statement on optimal surgical management of goiter. Thyroid. 2014;24(2):181-9. DOI: 10.1089/thy.2013.0291.

2. Durante C, Costante G, Lucisano G, Bruno R, Meringolo D, Paciaroni A, Puxeddu E, Torlontano M, Tumino S, Attard M, Lamartina L, Nicolucci A, Filetti S. The natural history of benign thyroid nodules. The Journal of the American Medical Association. 2015;313(9):926-35. DOI: 10.1001/jama.2015.0956.

3. Baloch ZW, LiVolsi VA. Current role and value of fine-needle aspiration in nodular goiter. The Journal of Clinical Endocrinology and Metabolism. 2014;28(4):531-44. DOI: 10.1016/j.beem.2014.01.010.

4. Jiang J, Huang L, Zhang H, Ma W, Shang X, Zhou Q, Gao Y, Yu S, Qi Y. Contrast-enhanced sonography of thyroid nodules. Journal of Clinical Ultrasound. 2015;43(3):153-56. DOI: 10.1002/jcu.22240. 5. Mauriello C, Marte G, Canfora A, Napolitano S, Pezzolla A, Gambardella C, Tartaglia E, Lanza M, Candela G. Bilateral benign multinodular goiter: What is the adequate surgical therapy? A review of literature. International Journal of Surgery. 2015;36(4):7-12. DOI: 10.1016/j.ijsu.2015.12.041.

6. Yoldas T, Makay O, Icoz G, Kose T, Gezer G, Kismali E, Tamsel S, et al.. Should subtotal thyroidectomy be abandoned in multinodular goiter patients from endemic regions requiring surgery? International surgery. 2015;100(1):9-14. DOI: 10.9738/intsurg-d-13-00275.1.

7. Miccoli P, Frustaci G, Fosso A, Miccoli M, Materazzi G. Surgery for recurrent goiter: complication rate and role of the thyroidstimulating hormone-suppressive therapy after the first operation. Langenbeck's Archives of Surgery. 2014;423(4):562-64. DOI: 10.1007/s00423-014-1258-7.

8. Rudolph N, Dominguez C, Beaulieu A, De Wailly P, Kraimps JL. The morbidity of reoperative surgery for recurrent benign nodular goitre: impact of previous unilateral thyroid lobectomy versus subtotal thyroidectomy. Thyroid Research. 2014. Article ID 231857. DOI: 10.1155/2014/231857.

9. González C, Franch-Arcas G, Gómez-Alonso A. Morbidity following thyroid surgery: does surgeon volume matter? Langenbeck's Archives of Surgery. 2013;398(3):419-22. DOI: 10.1007/s00423-012-1027-4.

10. Knobel M. Which Is the Ideal Treatment for Benign Diffuse and Multinodular Non-Toxic Goiters? Frontiers in Endocrinology (Lausanne). 2016;7(48). DOI: 10.3389/fendo.2016.00048.

11. Attaallah W, Erel S, Canturk NZ, Erbil Y, Gorgulu S, Kulacoglu H, Kocdor MA, Kebudi A, Ozbas S, Gulluoglu BM. Is hemithyroidectomy a rational management for benign nodular goitre? A Multicentre Retrospective Single Group Study. The Netherlands Journal of Medicine. 2015;73(1):17-22.

12. Dakubo JC, Naaeder SB, Tettey Y, Gyasi RK. Pathology and the Surgical Management of Goitre in an Endemic Area Initiating Supplementary Iodine Nutrition. West African Journal of Medicine. 2013;32(1):45-51.

13. Rayes N, Seehofer D, Neuhaus P. The surgical treatment of bilateral benign nodular

goiter. Balancing Invasiveness With Complications. Deutsches Ärzteblatt International. 2014;111(10):171-8.

DOI: 10.3238/arztebl.2014.0171.

14. Bauer PS, Murray S, Clark N, Pontes DS, Sippel RS, Chen H. Unilateral thyreoidectomy for the treatment of benign multinodular goiter. Journal of Surgical Research. 2013;184:541-8.

15. Kuroda K, Uchida T, Nagai S, Ozaki R, Yamaguchi T, Sato Y, Takeda S. Elevated serum thyroid-stimulating hormone is associated with decreased anti-Müllerian hormone in infertile women of reproductive age. Journal of assisted reproduction and genetics. 2015;32(2):243-7.

16. Zimmermann MB, Aeberli I, Andersson M, Assey V, Yorg JAJ, Jooste P, San Luis Jr. TO. Thyroglobulin is a sensitive measure of both deficient and excess iodine intakes in children and indicates no adverse effects on thyroid function in the UIC range of 100–299 μg/l: a UNICEF/ICCIDD study group report. The Journal of Clinical Endocrinology & Metabolism. 2013;98(3):1271-80. DDC-UDC 611.216.013

DOI:10.19221/201747

Yemelyanenko N.R.

M.G. Turkevich Department of Human Anatomy, Higher State Educational Establishment of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, kovalskan@ukr.net

ANATOMICAL TRANSFORMATIONS OF THE NASAL SEPTUM IN CHILDHOOD

Abstract. Methods of preparation, morphometry, radiography, and photodocumentation were used to study 20 preparations of the nasal region of childhood, the formation and morphological transformations of the nasal septum of a human.

Key words: nasal septum, childhood, ontogenesis, human.

Introduction. Morphological studies of the nasal region, at whatever structural level they are not conducted, are aimed at revealing the mechanisms and pathogenesis of diseases and searching for effective methods of treatment. The study of the nasal septum is of practical value, since developmental defects that require surgical correction, elimination of polyposis growths of its mucous membrane, treatment of chronic posttraumatic lesions bleeding, are often encountered here. One of the conditions for the successful resolution of these problems is a thorough study of the anatomical features of the nasal septum at each stage of development [1-3]. The question of the causes of deflection of the nasal septum now is the point of wide discussions among scientists in the pages of the scientific literature. But all the published interpretations remain fragmented, scattered and incomplete. [4].

The objective of the study. To study the morphological features of the nasal septum in childhood and to investigate possible variants of its structural organization.

Materials and methods. 20 biological preparations and organocomplexes of the nasal area of childhood were investigated by methods of regular and fine preparation with the help of the MBS-10 microscope, the topographic anatomical sections, X-ray and morphometry.

Results and discussion. During the early childhood, the forming processes of the nasal septum continue. In the perpendicular plate of the latticed bone, the gradual replacement of the cartilaginous tissue by the bone begins. In the process of growth, the anteroposterior size of the vomer exceeds the vertical one. The thickness of

the vomer is almost unchanged.

During the study of preparations of young children (the period from one to three years) it was established that the cartilaginous part of the nasal septum forms a homogeneous cartilaginous tissue, it is not possible to macroscopically distinguish the cartilage of the nasal septum from the perpendicular plate of the latticed bone in this age period. The bony part of the nasal septum is formed by the vomer, which is represented by a homogeneous plate. At the posterior margin of the plate the wings are more pronounced, which adhere to the body of the sphenoid bone. Anteroposterior size of the vomer exceeds $30.2 \pm 0.6 \text{ mm}$, vertical $11.2 \pm 0.13 \text{ mm}$.

Anteroposterior size of nasal septum in infants is 39.0 ± 0.5 mm, maximum vertical dimension is 24.0 ± 0.4 mm. The thickness of the cartilaginous plate of the nasal septum is 2.4 ± 0.05 mm, and together with the mucosa it is 3.2 ± 0.13 mm. On 8 preparations (30%) in the anterior section of the nasal septum a blind canal was found, which is the organ of Jacobson.

During early childhood (4-7 years), the vomer of the cartilage of the nasal septum approaches the quadrangular. The perpendicular plate of the latticed bone is already 85-90% represented by bone tissue. The cartilaginous tissue (growth site) is located at the junction of the lower edge of the perpendicular plate of the latticed bone and the cartilage of the nasal septum with the upper edge of the vomer.

In the period of late childhood (8-12 years) there is a complete ossification of the perpendicular plate of the latticed bone. At the junction of the perpendicular plate and cartilage of the nasal septum with the upper edge of the

couch, a segment of growth still remains. There are more intensive changes in the shape and size of the nasal septum as a whole. Its cartilage already has an irregular quadrangular shape.

The mucous membrane that lines the nasal cavity is covered with a high, multi-rowed cylindrical epithelium, in which cilia are well expressed. In the respiratory region of the nucleus its cells form 3-4 rows, and in the olfactory region 4-5. The thickness of the epithelium, in comparison with the previous age period, does not change.

The contours of the glands become more distinct. The diameter of the vessels of the anterior and posterior trellis arteries ranges from 0.28 to 0.38 mm. The number of branches of the second order is 2 (lateral and medial), branches of the third order - from 5 to 7. The diameter of the latter is 0,08 - 0,1 mm. The pterigo-palatine artery in 6 cases (20%) had 4, in two (5%) - 3 and in 5 (15%) - 2 posterior lateral nasal branches. Their diameter varies from 0.36 to 0.4 mm. They branch, mainly in the area of the lower and middle nasal conchaes and the corresponding nasal passages, where they form loops of various shapes and sizes.

The diameter of the posterior artery of the nasal septum is 0.3 - 0.6 mm. It is divided into branches of the second order (lower and upper).

In the study of nerves, it was found that the medial superior posterior nasal branches penetrate into the posterior sections of the nasal septum, which begin from the wing-palatal node and manifest in its mucosa. The nasopharyngeal nerve passes in the descending direction, branches into large branches in the mucosa of the nasal septum. All the main nerve trunks 0.46-0.5 mm in diameter are located in the deep layer of

the mucous membrane, where they are distributed into the secondary and tertiary branches. In places of thickening of the mucous membrane, the nerve fibers almost perpendicularly pass through the epithelial lining.

Topographically, the most superficial are the glands and a small mesh of vessels, then the nerves and vessels of the middle caliber and the deepest are the large trunks of nerves and vessels.

Conclusion. Formation of the nasal septum begins in the early period. At the end of early childhood, it is a homogeneous cartilaginous tissue, which is supplemented by a bone shaving. The ossification of the perpendicular plate of the latticed bone ends in the period of late childhood.

The mucous membrane is lined with a high cylindrical ciliated epithelium.

During development, the greatest concentration of blood vessels is in the anterior part of the nasal septum.

Perspectives for further research. It is planned to investigate the features of the nasal septum in mature and elderly periods of a human.

References:

1. Makar BG. Stanovlennja ta topografo – anatomichni vzaєmovidnoshennja nizhn'oï stinki porozhnini nosa iz sumizhnimi strukturami u rann'omu ontogenezi ljudini. Nauk visn Uzhgorod un-tu Serija Medicina. 1999;7:32-6.

2. Makar BG. Osoblivosti budovi i sintopichni vzaєmovidnosini stinok nosa iz sumizhnimi strukturami v rann'omu ditinstvi. Ukr med Al'manah. 2002;5(5):89-91.

3. Makar BG. Sintopichni osoblivosti bichnoï stinki nosa junac'kogo viku. Morfologija. 2002;8(2):299-301.

4. Emel'janenko NR. Vikova anatomija nosovoï peregorodki. Morfologija. 2009;3(3):16-20.

DDC-UDC 611.36+611.342]-018-053.3

DOI:10.19221/201748

Kavun M.P.

M.G. Turkevich Department of Human Anatomy, Higher State Educational Establishment of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, kovalskan@ukr.net

MORPHOGENESIS OF THE HEPATIC-DUODENUM LIGAMENT IN EARLY ONTOGENESIS OF THE HUMAN

Abstract. With the help of a set of morphological methods, the sources of hepatic-duodenal ligament formation (HDL) have been determined. It has been established that the formation of HDL occurs through the process of gradual transformation of the ventral mesentery of the embryo, namely, its transition from the sagittal plane to the frontal one, starting from the sixth week of intrauterine development and until the end of the embryonic period. The dynamics of morphological changes in the structure of the aforementioned ligament and its components (bile ducts, arteries and veins) in the embryonic and pre-fetal period of human ontogenesis was also studied. With the help of a complex of modern morphological techniques, their correlation relationships have been established with the purpose of determining the time and morphological prerequisites for the occurrence of structural variants and developmental defects of the above-mentioned formations.

Key words: hepatic-duodenal ligament, bile ducts, hepatic artery, portal vein of the liver.

Introduction. Morphological studies of the nasal region, at whatever structural level they are not conducted, are aimed at revealing the mechanisms and pathogenesis of diseases and searching for effective methods of treatment. The study of the nasal septum is of practical value, since developmental defects that require surgical correction, elimination of polyposis growths of its mucous membrane, treatment of chronic bleeding, posttraumatic lesions are often encountered here. One of the conditions for the successful resolution of these problems is a thorough study of the anatomical features of the nasal septum at each stage of development [1-3]. The question of the causes of deflection of the nasal septum now is the point of wide discussions among scientists in the pages of the scientific literature. But published all the interpretations remain fragmented, scattered and incomplete. [4].

The objective of the study. To study the morphological features of the nasal septum in childhood and to investigate possible variants of its structural organization.

Materials and methods. 20 biological preparations and organocomplexes of the nasal area of childhood were investigated by methods of regular and fine preparation with the help of the MBS-10 microscope, the topographic anatomical sections, X-ray and morphometry.

Results and discussion. During the early childhood, the forming processes of the nasal septum continue. In the perpendicular plate of the latticed bone, the gradual replacement of the cartilaginous tissue by the bone begins. In the process of growth, the anteroposterior size of the vomer exceeds the vertical one. The thickness of the vomer is almost unchanged.

During the study of preparations of young children (the period from one to three years) it was established that the cartilaginous part of the nasal septum forms a homogeneous cartilaginous tissue, it is not possible to macroscopically distinguish the cartilage of the nasal septum from the perpendicular plate of the latticed bone in this age period. The bony part of the nasal septum is formed by the vomer, which is represented by a homogeneous plate. At the posterior margin of the plate the wings are more pronounced, which adhere to the body of the sphenoid bone. Anteroposterior size of the vomer exceeds $30.2 \pm 0.6 \text{ mm}$, vertical $11.2 \pm 0.13 \text{ mm}$.

Anteroposterior size of nasal septum in infants is 39.0 ± 0.5 mm, maximum vertical dimension is 24.0 ± 0.4 mm. The thickness of the cartilaginous plate of the nasal septum is 2.4 ± 0.05 mm, and together with the mucosa it is 3.2 ± 0.13 mm. On 8 preparations (30%) in the anterior section of the nasal septum a blind canal was found, which is the organ of Jacobson. During early childhood (4-7 years), the vomer of the cartilage of the nasal septum approaches the quadrangular. The perpendicular plate of the latticed bone is already 85-90% represented by bone tissue. The cartilaginous tissue (growth site) is located at the junction of the lower edge of the perpendicular plate of the latticed bone and the cartilage of the nasal septum with the upper edge of the vomer.

In the period of late childhood (8-12 years) there is a complete ossification of the perpendicular plate of the latticed bone. At the junction of the perpendicular plate and cartilage of the nasal septum with the upper edge of the couch, a segment of growth still remains. There are more intensive changes in the shape and size of the nasal septum as a whole. Its cartilage already has an irregular quadrangular shape.

The mucous membrane that lines the nasal cavity is covered with a high, multi-rowed cylindrical epithelium, in which cilia are well expressed. In the respiratory region of the nucleus its cells form 3-4 rows, and in the olfactory region 4-5. The thickness of the epithelium, in comparison with the previous age period, does not change.

The contours of the glands become more distinct. The diameter of the vessels of the anterior and posterior trellis arteries ranges from 0.28 to 0.38 mm. The number of branches of the second order is 2 (lateral and medial), branches of the third order - from 5 to 7. The diameter of the latter is 0,08 - 0,1 mm. The pterigo-palatine artery in 6 cases (20%) had 4, in two (5%) - 3 and in 5 (15%) - 2 posterior lateral nasal branches. Their diameter varies from 0.36 to 0.4 mm. They branch, mainly in the area of the lower and middle nasal conchaes and the corresponding nasal passages, where they form loops of various shapes and sizes.

The diameter of the posterior artery of the nasal septum is 0.3 - 0.6 mm. It is divided into branches of the second order (lower and upper).

In the study of nerves, it was found that the medial superior posterior nasal branches penetrate into the posterior sections of the nasal septum, which begin from the wing-palatal node and manifest in its mucosa. The nasopharyngeal nerve passes in the descending direction, branches into large branches in the mucosa of the nasal septum. All the main nerve trunks 0.46-0.5

mm in diameter are located in the deep layer of the mucous membrane, where they are distributed into the secondary and tertiary branches. In places of thickening of the mucous membrane, the nerve fibers almost perpendicularly pass through the epithelial lining.

Topographically, the most superficial are the glands and a small mesh of vessels, then the nerves and vessels of the middle caliber and the deepest are the large trunks of nerves and vessels.

Conclusion. Formation of the nasal septum begins in the early period. At the end of early childhood, it is a homogeneous cartilaginous tissue, which is supplemented by a bone shaving. The ossification of the perpendicular plate of the latticed bone ends in the period of late childhood.

The mucous membrane is lined with a high cylindrical ciliated epithelium.

During development, the greatest concentration of blood vessels is in the anterior part of the nasal septum.

Perspectives for further research. It is planned to investigate the features of the nasal septum in mature and elderly periods of a human.

References:

1. Molmenti EP, Pinto PA, Klein AS. Normal and variant arterial supply of the liver and gallbladder. Pediatr Transplantation. 2003;7:80-2.

2. Minkov IP. Monitoring vrozhdennyh porokov razvitija, ih prenatal'naja diagnostika, rol' v patologii u detej i puti profilaktiki. Perinatol ta pediatrija. 2000;(1):8-13.

3. Kulakov VI, Baharev VA, Fanchenko ND. Sovremennye vozmozhnosti i perspektivy vnutriutrobnogo obsledovanija ploda. Ross med zh. 2002;(5):3-6.

4. Karaliotas CCh, Broelsch CE, Habib NA. Liver and biliary tract surgery: embryological anatomy to 3D-imaging and transplant innovations. Wien: Springer-Verlag; 2006. 640 p.

5. Ahtemijchuk JuT. Aktual'nist' naukovih doslidzhen' u galuzi perinatal'noï anatomiï. Neonatologija, hirurgija ta perinatal'na medicina. 2012;3(1):15-21.

6. Kulakov VI, Isakov JuF, Kucherov JuI. Prenatal'naja diagnostika i lechenie vrozhdennyh porokov razvitija na sovremennom jetape. Ros vestn perinatol i pediatrii. 2006;51(6):63-5.

7. Aubrey Milunsky MB, Milunsky MJ. Genetic disorders in the fetus, diagnosis, prevention and treatment. 6th ed. 2009:1120-28.

DDC-UDC 616.126.42-089.28-003.96

DOI:10.19221/201749

Kotyuzhinskaya S.G.,

MD, Dean of the Faculty of Medicine No. 1, Professor of General and Clinical Pathological Physiology, Odessa National Medical University, Ukraine. Sveta67kot@mail.ru

Umansky D.A.

Cand. of Medical Sciences, Associate Professor of Forensic Medicine, Odessa National Medical University, Ukraine

FUNCTIONAL STATE OF LIPITRANSPORT SYSTEM IN PATIENTS WITH ATHERSCLEROSIS WITH FATTY LOAD

Abstract. Postprandial dyslipidemia is considered as one of the leading factors affecting the development and progression of atherosclerosis, due to the prolonged exposure of lipoproteins in the systemic circulation, the activation of their oxidative modification. However, until now latent atherogenic abnormalities in the lipid transport system have not been adequately studied. The aim of our study was to study the state of the lipid transport system and its functional activity under fat loading conditions in patients with atherosclerosis. 51 patients took part in the survey, 26 of them men and 25 women, the average age of 55.65 ± 2.43 years, who signed the information agreement. All patients were divided into groups on nosological characteristics. The technique of the standard disposable food fat load, proposed by J. Patsch, has been applied. In the course of the study, the fatty acid spectrum of the blood and lipoprotein lipase activity were evaluated. A pronounced decrease in the lipid transport system tolerance to fat loading was revealed, which manifested itself in a significant increase in the content of saturated and decreased ω -3 polyunsaturated fatty acids in plasma against the background of inadequate lipoprotein lipase activity in patients with atherosclerosis.

Key words: fatty acid spectrum of blood, lipoprotein lipase, fat load, atherosclerosis.

Introduction. Numerous international and national programs for combating diseases of the cardiovascular system convincingly show that atherosclerosis is one of the most widespread diseases of our time, which has maintained a stable tendency to growth during the last decades [1, 8].

In the pathogenesis of atherosclerosis, the main role is played both by disorders of the lipid transport system in the body, and by the various types of nutritional loads that are an integral part of everyday human life [4, 6, 7]. It was found that the disorders in postprandial metabolism of plasma lipids leads to a prolonged exposure of lipoproteins in the systemic circulation, activation of their oxidative modification, which increases the risk of atherosclerotic vascular injury [2, 10].

The literature highlights the use of fat loading to study the metabolism of lipoproteins in humans, which allows us to characterize the changes in the lipid transport system and to search for markers of possible atherogenic changes that occur in humans after taking fatty foods [3, 5, 9]. At the same time, to the present time, little attention was paid to the stage of lipid assimilation by the tissue itself. At the same time, it is known that somatic cells, primarily muscle, use mainly fatty acids in metabolism. The key mechanism of their use in tissues is cleavage due to lipoprotein lipase, fixed on the vessel wall [11, 12].

The objective of our study was to study the functional activity of the lipid transport system under fat loading conditions in patients with atherosclerosis, taking into account the activity of lipoprotein lipase.

Materials and methods of research. 51 patients took part in the survey, 26 of them men and 25 women aged 45 to 62 years (mean age 55.65 ± 2.43 years). All patients were divided into groups: 17 patients were included in the group with diffuse cardiosclerosis at normal values of arterial pressure (AP), among them 9 men and 6 women (mean age 57.62 ± 1.52 years). The group of patients with diffuse cardiosclerosis in combination with essential hypertension (AP + EH) included 10 men and 9 women (mean age 56.23 ± 1.96 years). The comparison group consisted of patients with stable coronary artery disease without special signs of coronary atherosclerosis - 15 men (7 men and 8 women, mean age 58.22 \pm 1.27 years). Practically healthy people were examined as controls - 12 people (8 men and 7 women, average age 42.97 \pm 1.18 years). The above groups were comparable in age and sex. Each patient gave information consent to participate in the study.

A single fat load was performed according to the method of J. R. Patsch (1983), which consisted of taking 20% cream with 50 grams of white bread (based on 65 g of emulsified fat per 1 m2 of the body surface) on an empty stomach for 5 minutes. Blood was taken on an empty stomach, 3 and 6 hours after eating.

The fatty acid blood profile was assessed by the content of palmitic, stearic, oleic, linoleic, arachidonic, α -linolenic, eicosapentaenoic (EPA) and docosahexaenoic (DHA) acids (gas chromatography method according to the F. Marangoni (2004) on Agilent MS chromatography mass spectrometer D 1100 (Hewlett Packard, USA).

Activity of blood plasma lipoprotein lipase was determined by titration according to the method of T.Olivecrona (1992) in the modification of V.N.Titov (2003) obtained from the median cubital vein 15 minutes after the administration of heparin from Biolec (Ukraine) at a dose of 50 IU / kg. The indicator of enzyme activity is the amount of released fatty acids from triglycerides for 1 hour (mmol/l h).

Results of the study and their discussion. The comparative characteristics of the fatty acid profile in different study groups revealed multidirectional changes. All the groups showed an increased level of saturated fatty acids (SFA) in fasting state and a reduced concentration of polyunsaturated (PUFA), with both ω -3 and ω -6 relative to the control group (Fig. 1). The values of ω -3 PUFA and ω -6 PUFA were approximately equal in the study groups.



Fig. 1. The fasting level of fatty acids in the blood in patients of the study groups.

It should be noted that the level of monounsaturated fatty acids (MUFA) was elevated only in the group of patients with AT + EH (25.11 \pm 2.27 vs. 17.66 \pm 3.20%), in the remaining groups the concentration of the fatty acids was at the level of control values.

In the first postprandial phase, after loading (in 3 hours), more pronounced changes in the concentration of SFA in IHD groups (54.78 \pm 2.17%) and AT + EH (54.35 \pm 2.63%) were noted (Fig. 2). At the same time, the increase in total SFA concentration was due to an increase in the level of stearic acid by 16.83% and 74.16%, respectively. While in the AT group the changes were proportional.





In contrast to the indices of healthy volunteers in the study groups, the concentration of ω -6 PUFA decreased, and the level of MUFA increased. The change in the level of ω -6 PUFA in the IHD and AT + EH groups resulted from a drop in the concentration of linoleic acid (by 19.91% and 27.75%, respectively), while in the control group and AT - by arachidonic acid (By 6.32% and 41.17%, respectively). The dynamics of ω -3 PUFA in all groups was unidirectional with control values.

The second phase of postprandial fat loading was characterized by an elevated SFA level in all study groups, while in the control group there was a drop in the level equally due to palmitic and stearic acids (Fig. 3).

The level of the SFA in the groups of patients with IHD and AT was lower than the control values, while in the AT + EH group it slightly exceeded the control data. In the group of healthy volunteers, a decrease in ω -6 PUFA was noted primarily as a result of a decrease in the concentration of linoleic acid (more than 4.5 times), and the level of arachidonic acid at that time increased 2-fold. In the comparison group, the relative amount of ω -6 PUFA was at the

Deutscher Wissenschaftsherold • German Science Herald, N 4/2017



Fig.3. Dynamics of fatty acids after fat loading in the study groups.

control level, but the change was due to a 2.5-fold increase in the concentration of arachidonic acid against a background of a 2-fold decrease in the level of linoleic acid. In the group of patients with AT, the content of ω -6 PUFA was higher both in control data and in comparison with other study groups. At the same time, the increase in concentration occurred as a result of an equal increase in the arachidonic titer and the fall of linoleic acid. Only in the AT + EH group there was a decrease in the level of ω -6 PUFA, the dynamics of changes was associated with an equivalent drop in linoleic acid against a background of increased arachidonic acid.

As to the ω -3 PUFA in all groups, a tendency to increase in concentration was observed. It was noted that the content of ω -3 PUFAs in the control group was higher than the initial data. In the IHD group, an increase in the concentration of ω -3 PUFA was due to α -linolenic acid, in patients with AT – EPA, and in the AT + EH group, insignificant growth was observed on the part of all acids. At the same time, the level of ω -3 PUFA in all study groups was lower than fasting data at the end of the test.

The studies showed an increase in the enzymatic activity of LPL throughout the study in all groups, without exception, relative to the baseline level (Figure 4). At the same time, the highest LPL activity was observed in the control group during the second phase of postprandial loading.

It should be noted that in patients with atherosclerosis, despite a low initial level of LPL, 6 hours after loading, the enzyme activity was maximal in comparison with other groups of patients, although 3 times lower than the control values.

At the same time, the level of fasting LPL in the IHD group was comparable to the control values,



Fig. 4. Lipoprotein lipase activity in the study groups as a function of fat load time.

it exceeded slightly the activity in the middle of the test and the control indices, and the indices of the remaining groups, but by 6 hours after the load the level of LPL was lower than the data in the AT group.

Studies have shown that the detected changes in the activity of LPL in different phases of the fat load lead to a decrease in the effectiveness of lipolysis, which disrupts the mechanism of cholesterol transport and lipoprotein metabolism in general.

Conclusions. Thus, under the conditions of atherosclerotic disorders there was revealed a marked decrease in the tolerance of the lipid transport system to fat load, manifested in a significant disruption of the transport of fatty acids against the background of inadequate lipoprotein lipase activity. Alimentary fat loading led to a prolonged (more than 6 hours) increase in the content of SFA on the background of a decrease in ω -3 PUFA in plasma.

The main change of the fatty acid blood spectrum was a decrease in the content of unsaturated fatty acids. Since unsaturated fatty acids are the starting material for the formation of regulatory molecules, disturbances in the lipid transport system cause changes in regulatory mechanisms, which in turn aggravate lipid metabolism disorders, and thus stimulate atherogenesis.

Changes in the fractional composition of higher fatty acids in patients with AT + EH after fat loading, in our opinion, are associated with endothelial dysfunction of the vascular wall, which is significantly manifested against the background of alimentary fat load with intensive work of the lipid transport system. The dynamics of the fatty acid spectrum in the group of patients with ischemic heart disease testified of latent disorders of the lipid transport system.

Prospects for the study. To study the state of the lipid transport system with carbohydrate load and to evaluate the correlation between changes in the lipid profile, fatty acids and lipoprotein lipase in the blood. This will allow in the future to receive new data on the pathogenesis of atherosclerosis.

References:

1. Bulaeva NI, Goluhova EZ. Jendotelial'naja disfunkcija i oksidativnyj stress: rol' v razvitii kardiovaskuljarnoj patologii. Kreativnaja kardiologija. 2013;(1):14-22.

2. Korneev NV, Davydova TV. Funkcional'nye nagruzochnye proby v kardiologii. M: MEDIKA; 2007. 126 p.

3. Maksimenko AV, Turashev AD. Funkcii i sostojanie jendotelial'nogo glikokaliksa v norme i patologii. Ateroskleroz i dislipidemii. 2011;(2):4-17.

4. Osipenko AN, Akulich NV, Klishevich FN. Zhirnye kisloty krovi i ih vzaimosvjazi pri ateroskleroze. Tavricheskij mediko-biologicheskij vest nik. 2012; 15(3).2(59):197-9.

5. Pristrom AM, Benhamed M. Oksidativnyj stress i serdechno-sosudistye zabolevanija. Lechebnoe delo. 2012;(2):19-23. 6. Titov VN, Lisicyn DM. Zhirnye kisloty. Fizicheskaja himija, biologija i medicina. Tver': Triada; 2006. 672 p.

7. Sherashov VS, Sherashova NV. Sovremennye nauchnye predstavlenija o faktorah riska razvitija serdechnososudistyh zabolevanij. Mat. Vsemirnogo Kongressa Kardiologii. Dubai. OAJe. Kardiovaskuljarnaja terapija i profilaktika. 2012; (2):96-100.

8. Shirokov EA. Insul't, infarkt, vnezapnaja smert': teorija sosudistyh katastrof. M: Izdatel'stvo KVORUM; 2010. 238 p.

9. Gungor ZB, Sipahioglu N, Sonmez H. Endothelial dysfunction markers in low cardiovascular risk individuals: comparison of males and females. J Med Biochem. 2017; 36:62-72. doi: 10.1515/jomb-2016-0030.

10. Libby P. Inflammation in atherosclerosis. Nature (Lond). 2012;430:868-74.

11. Kusunoki M, Tsutsumi K, Natsume Y. Lipoprotein lipase and atherosclerosis. Intern J Collabor. Research on Internal Medicine & Public Health. 2015; 7(9):179-89.

12. Yasuda T, Ishida T, Rader DJ. Update on the role of endothelial lipase in high-density lipoprotein metabolism, reverse cholesterol transport, and atherosclerosis. Circ J. 2010;(74):2263-70. DDC-UDC 612.46: 612.017.2: 612.825.33

Lomakina Yu.V.,

Burdeina M.P.

Higher State Educational Establishment of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, lomakinajulia@yahoo.com

STRESS-ASSOCIATED CHANGES IN THE EXCRETORY FUNCTION OF THE KIDNEYS IN OLD RATS UNDER THE CONDITIONS OF A USUAL LIGHT PERIOD

Abstract. The research deals with the study of the functioning of kidneys in old rats under conditions of immobilization stress under usual illumination. When simulating a 60-minute immobilization stress against the background of the physiological function of the pineal gland, significant changes in the chronorrhythms of the kidneys excretory function in old rats were revealed in comparison with intact animals. Dynamics of functional rearrangements of the excretory function of the kidneys of old rats under the conditions of the physiological duration of the light regime and in the conditions of immobilization is established.

Key words: kidney function, immobilization stress, chronorhythm, old rats.

Introduction. An important role in the ability to maintain a relatively constant water-mineral composition for various pathological conditions, including immobilization stress, belongs to the functional activity of the kidneys [1, 4, 6].

Kidneys occupy an important place in ensuring the dynamic balance of the internal environment of the body. They, like any other biological system, are characterized by a clear temporal organization of functions subject to a clear circadian cycling [3, 2, 7].

It is now well known that stress is one of the main causes of the development of the pathological process [5]. Stress precedes the development of adaptive reactions and functional disorders.

The questions concerning the chronobiologic pattern of kidneys functioning in accordance with the daily cycle of the excretory function of the kidneys under the influence of stress factors remain poorly studied. The elucidation of this issue is important not only theoretical but also practical, since it will allow improving the methods of diagnosis, prevention and treatment of renal pathology, taking into account the dependence of the features of its appearance and flow on the phases of the day under stress conditions.

Objective of the study: to clarify the circadian features of the excretory function of the kidneys of old rats in normal and stress conditions.

Material and methods. The studies were carried out in experiments on 36 old white male rats weighing 300 ± 10 g, observing the general principles of bioethics. Within 1 month before and during the experiment, the animals were kept in a vivary at a constant temperature (18-21 ° C), humidity (50-55%), in separate cells with free access to water and food. To model the physiological function of the pineal gland (PG) to experimental animals, a universal luminescence approach was used. For control, rats were kept for 7 days under standard light conditions - LD (illumination from 08.00 to 20.00, exposure of 500 Lux by fluorescent lamps at the level of cells). Immobilization stress was modeled by keeping the animals for 1 h in plastic pencil-box cells.

During the experimental studies we divided the mentioned number of rats on the series. So, series I included intact animals, kept under natural conditions of illumination; series II - control animals, kept in the vivary with the following light conditions: 12:00 of illumination, 12:00 of darkness (physiological condition of the PG); series III - determination of chronorhythmic features of the kidneys excretory function in old rats under conditions of 1-hour immobilization stress.

24 hours before the end of each series of experiments, the animals were kept without food with free access to water. On the 8th day of the

experiment at 14.00, euthanasia of the rats was performed by decapitation. The whole blood was stabilized with a solution of EDTA (1.0 mg / ml blood), the plasma was separated (centrifugation at 3000 rpm, 15 min) from erythrocytes (the last were washed three times with chilled saline sodium chloride). The results were processed by the statistical method of "cosine analysis", as well as parametric methods of variation statistics. Diagnosis of desynchronosis was carried out on the basis of an analysis of changes in the characteristics of the mesic (average daily level), amplitude, acrophase and the shape of the curve of the circadian rhythm.

The individual chronograms obtained for each animal were grouped according to the principle of the identity of the maximum acrophase and the average for each group of chronograms meson, amplitude and phase structure (over the interval between acro and batiphase) were calculated by the method of cosine analysis.

Excretory renal function was assessed by absolute and relative diuresis, GFR, creatinine concentration in blood plasma, relative water reabsorption, protein concentration in urine, and its excretion.

Results of the study and their discussion. The maintenance of animals in the conditions of IS led to a significant change in the circadian organization of the excretory function of the kidneys (Table 1). The diuresis is below the reference level by 12.1%. Minimal urination was recorded between 16.00 and 20.00, when the level of the indicator decreased by approximately 38% of the control values. It is characteristic that the stress of the rats increased the amplitude of the rhythm with the displacement of the acrophase at 20.00 (Fig. 1).

Such changes in the daily average diuresis are caused by a disruption of the glomerular filtration rate. Under the influence of the stress factor, the rate of ultrafiltration decreased at 12.00, 16.00 and 24.00, (Fig. 2), while the amplitude was almost twice that of intact rats (Table 1).

Along with the increase in the glomerular filtration rate, the level of relative reabsorption of water increased, which indicates the preservation of the mechanisms of the glomerular-tubular balance.

Stressing of animals caused a significant

decrease in the excretion of potassium ions. In particular, at 04.00 h this indicator decreased by 4 times, at 20.00 - three times, (Table 1). The concentration of potassium ions in urine also changed in the same way (Fig. 3), the rhythm of which increased by 8%. Amplitudes of rhythms, like in the previous cases, also increased.



Fig. 1. Chronorhythms of diuresis in rats under conditions of immobilization stress.



Fig. 2. Chronorhythms of glomerular filtration rate in rats under conditions of immobilization stress.



Fig. 3. Chronorhythms of concentration of potassium ions in rat urine under conditions of immobilization stress.

Immobilization of animals for 1 hour led to a significant increase in the concentration of protein in the urine in almost all periods of observation. The rhythm acquired an inverse character relative to the control chronograms. When recalculated per 100 μ l of glomerular filtrate, the average daily protein excretion level exceeded the control values by 37% and amounted to 1.09 ± 0.17 mg / 100 μ l of glomerular filtrate with an amplitude of 44.7% (Table 1).

Table 1.

Impact of immobilization stress on mesor and rhythm amplitude of excretory renal function in old

rats ($x \pm S_x^-$).				
	Intact (n=6)		Immobilization stress (n=6)	
Indices	Mesor	Amplitude (%)	Mesor	Amplitude (%)
Diuresis, μl / min / 100g	1,82±0,11	16,6±3,98	1,6±0,16	27,1±6,67
Concentration of potassium ions in blood plasma, μmol / l	5,07±0,01	0,4±0,12	4,94±0,17	8,6±2,91 p<0,001
Concentration of potassium ions in urine, mmol / I	201,25±24,19	26,4±8,33	23,09±1,55 p<0,001	18,2±5,62
Excretion of potassium ions, μmol / min / 100g	35,4±3,56	26,9±5,03	3,800±0,05 p<0,001	19,5±6,11
Concentration of creatinine in plasma, μmol / l	75,22±0,22	0,7±0,24	61,25±2,15 p<0,001	9,4±2,93 p<0,02
Glomerular filtration rate, μl / min / 100g	60,06±3,34	14,2±3,61	69,74±7,4	26,8±7,66
Relative water reabsorption,%	98,74±0,03	0,1±0,02	98,99±0,06 p<0,01	0,1±0,05
Concentration index of endogenous creatinine	0,01±0,002	5,2±2,42	0,01±0,001	12,1±4,03
Concentration of protein in urine, g / I	0,38±0,02	12,9±4,53	0,65±0,05 p<0,001	20,7±4,22
Protein excretion, mg / min / 100g	0,71±0,05	20,3±3,11	1,09±0,17 p<0,05	44,7±7,08 p<0,01

Notes:

p - probability of differences between the indices of experimental and intact animals;

n - number of animals.

Conclusions. The results of researches have found out close connection between daily changes of parameters of kidneys excretory function and immobilization stress. Immobilization stress in old rats leads to changes in the integral indices of chronorrhythms of the kidneys excretory function -a decrease in the urinary flow with a compensatory increase in the relative reabsorption of water, a significant decrease in the excretion of potassium ions, which indicates a significant damaging effect of immobilization and deep tissue damage.

References:

1. Morukov BV, Noskov VB, Larina IM. Vodnosolevoj obmen i funkcija pochek v kosmicheskih poletah i nazemnyh model'nyh eksperimentah. Ros. fiziol. zh. 2003;89(2):146-53.

2. Zamorskij II, Pishak VP. Funkcional'naja organizacija fotoperiodicheskoj sistemy golovnogo mozga. Uspehi fiziolo¬gicheskih nauk. 2003;34(4):37-53. 3. Komarov FI. Hronobiologija i hronomedicina. Moskva. Triada-H; 2000. 488s.

4. Lomakina JuV. Zmini pokaznikiv ekskretornoï ta kislotoreguljuval'noï funkcij nirok za umov svitlovoï derivaciï. Materiali IX Mizhregional'noï naukovoï konferenciï «Aktual'ni pitannja biologiï ta medicini». 2011. Lugans'k. 45-7.

5. Pavlov AS. Fiziologicheskie mehanizmy gomeostaticheskogo obespeche¬nija cheloveka pri stresse. Fiziol. cheloveka. 2001; 27(1):65-73.

6. Pishak VP, Krivchans'ka MI, Gricjuk MI, Lomakina JuV, Homenko VG. Pokazniki nirkovih funkcij za umov standartnogo rezhimu osvitlennja ta diï anaprilinu. Bukovins'kij medichnij visnik. 2012; 3(63):183-5.

7. Lomakina JuV. Hronoritmicheskie pokazateli ionoregulirujushhej funkcii pochek pri vvedenii melatonina na fone giperfunkcii pineal'noj zhelezy. VII Mezhdunarodnyj kongress «Slabye i sverhslabye polja i izluchenija v biologii i medicine».2015 Sent. Sankt-Peterburg:170-1.
DDC-UDC 618.346-008.8

Malyar V.V.

PhD, Associate Professor, Chair of Obstetrics and Gynecology, SHEE "Uzhhorod National University", Uzhgorod, Ukraine, MVitV1975@ukr.net

STRUCTURAL AND FUNCTIONAL FEATURES OF FETAL MEMBRANES IN PREGNANT WOMEN WITH MODERATE IDIOPATHIC OLIGO- AND POLYHYDRAMNIOS

Abstract. In-process the resulted is given about morphofunctional changes in structural components of fruit shells from woman at moderate idiopathic small- and high water-level. It is well-proven that the most expressive structural changes are observed for women at development of shortage of water of obscure etiology.

Keywords: pregnancy, fruit shells, shortage of water, high water-level.

Introduction. Among the many causes that lead to the disruption of normal growth and development of the fetus, the condition of the amniotic fluid occupies an important place [1, 3, 6]. As a result of changes in the amniotic fluid volume, fetal hypoxia, delay in its development and, as a consequence, an increase in perinatal pathology, which reaches 60%, occurs [2, 4].

Therefore, the morphological study of the paraplacental system of amniotic fluid exchange in women with moderate idiopathic oligo-and polyhydramnios acquires a special clinical significance.

Objective of the study. To study the structural and functional features of the fetal membranes in women with moderate idiopathic oligo-and polyhydramnios.

Materials and methods. The study was conducted in two representative groups: 50 pregnant women with moderate idiopathic oligoamnios (group I) and 50 with polyhydramnios (group II), who had this pathology diagnosed in 30-32 weeks of gestation. The control group consisted of 50 women with normal pregnancy.

After expulsion of afterbirth, a fragment of the tissue of the membranes was taken for morphological examination, fixed in a 10% solution of neutral formalin for 24 hours, followed by processing in increasing concentration alcohols and pouring into paraffin.

On the histological sections of the membranes with an increase in the light microscope MBI-3x94.5 (objective x9; eyepiece x7; binocular nozzle AU-12x1.5) relative areas of the structural components of the membranes in percent using a periodic morphological grid were determined by the morphological method of S.B.Stefanov (1982) [5].

Microphotography of structural components of fetal membranes was carried out on a digital camera Sony DSH-HS, 7.2 Mpx.

Statistical analyzes of digital values of morphometric parameters were evaluated using the statistical package "STATISTICA 7.0".

Results of the study and their discussion. As the studies have shown, in all patients with low-resistant blood flow in the vascular network of the decidual membrane against the background of increased osmolarity of the blood plasma in the mother, as in moderate idiopathic oligoamnios, so in the case of polyhydramnios, there were no significant deviations of the fetus and stuctural components of the membranes (> 0.05).

Fetal membranes, as in physiological pregnancy, consisted of unchanged: amniotic epithelium (AE), compact layer (CL), layer of cytotrophoblast (LC), decidual (DL), endometrial glands (EG) and utero-decidual vessels (DV) (Fig. 1).

Morphological indices of relative areas of structural components of fetal membranes are given in Table.

As can be seen from the data in Table 1, in the case of moderate idiopathic polyhydramnios, a significant increase in the area of the compact layer was observed 1.4 times (22.65 \pm 2.24, respectively, compared to 16.84 \pm 1.23, p <0.05). In this case, edema of individual sections of a compact layer was also 2.6 times more frequent. At the same time, in cases of moderate idiopathic



Fig. 1. The structure of the membranes at the end of pregnancy. Staining with hematoxylin eosin. Sat: about. × 10 ca. × 10. AE - amniotic epithelium; CL is a compact layer; LC - layer of the cytotrophoblast; DL - a decidual layer; endometrial glands (GE) uterodecidual vessels (DV).

oligoamnios, as in atrophic damage (Figure 2), and in the case of dysontogenic changes (Figure 3) of the decidual layer of membranes, the relative area did not differ significantly from the control group (p < 0.05).

According to our studies, the relative area of the eosinophilic layer was 1.2 times greater than in the control group as in case of polyhydramnios, and in cases of a dysontogenic form of moderate idiopathic oligoamnios. The maximum relative area of the vacuolized cytotrophoblast was established in the case of polyhydramnios (5.52 \pm 1.82 vs. 0.91 \pm 0.31, p <0.001).

In this case, a decrease in the relative stromal area (respectively, 29.13 \pm 5.18 and 32.13 \pm 5.63 vs. 44.13 \pm 2.73 in the control group, p <0.05) was observed. The largest area of the vascular component was found in the mesh transformation of the decidual layer in the case of moderate idiopathic oligoamnios and in polyhydramnios (respectively, 1.41 \pm 0.16 and 1.46 \pm 0.23 vs 3.10 = 0.40 in the control group, p <0 , 05). At the same time, in these cases an increase in the relative area of the endometrial glands was noted (2.15 \pm 0.84, 2.38 = 0.65 vs. 1.96 \pm 0.21 in the control group, p <0.05).

Consequently, the disruption of paraplacental metabolism of amniotic fluid is closely related to the structural components of the membranes and their changes.

Conclusion. The foregoing indicates that the pathogenetic mechanisms of the development of moderate idiopathic oligo- and polyhydramnios lie as morphofunctional changes in the decidual **Table**

	Oligoa	amnios				
Structural components	n=	=50	Polyhydramnios	Control group		
of the membranes	А	В	n=50	n=50		
	n=38	n=12				
Amniotic epithelium	5,91±0,81	5,93±0,32	6,38±0,31	6,29±0,56		
Compact layer	15,69±1,73	13,85±2,18	22,65±2,24 [×]	16,84±1,23		
Edema areas of the compact layer	2,57±1,56	3,60±1,31	5,64±2,80	2,17±0,75		
Eosinophilic cytotrophoblast	19,89±1,76	21,87±4,27	20,86±2,78	18,16±1,64		
Vacuolized cytotrophoblast	1,57±0,06	1,72±1,41	5,52±1,82 ^{××}	0,91±0,31		
Atrophic villi	1,78±0,42 [×]	5,25±2,68 [×]	2,64±1,35	0,62±1,26		
Fibrinoid	1,65±0,48	4,19±2,28 [×]	1,49±1,24	0,89±0,36		
		Decidual layer				
Stroma	39,11±4,24	32,13±5,63 [×]	29,13±5,18 [×]	44,13±2,73		
Endometrial glands	2,38±0,65	1,24±0,52	2,15±0,84	1,96±0,21		
Blood vessels	1,46±0,23	2,10±0,03	1,41±0,16 [×]	3,10±0,40		
Pathology	7,99±2,31	8,12±3,14	2,13±0,78	4,93±0,11		

Changes in the relative areas of structural components of fetal membranes with oligo- and polyhydramnios (M ± m)

Note: * *p* <0.05 relative to the control group; ** *p* <0.001 relative to the control group. A - oligoamnios against a background of atrophy of the decidual layer; B – oligoamnios under conditions of dysontogenic form.



Fig. 2. Atrophic large mesenchymal villus in the thickness of the vacuolized cytotrophoblast. Coloring of hematoxylin-eosin. Sat.: ob.x20, approx. X10.



Fig. 3. Fragment of the fetal membrane with a dysontogenic form of moderate idiopathic oligoamnios. Coloring of hematoxylin-eosin. Sat.: about. 20 ca. X20.

and amniotic layers of the membranes, and in their structural components.

Prospects for further research. A promising direction is the work on improving the technology of managing pregnancy in the case of moderate idiopathic oligo- and polyhydramnios taking into account paraplacental metabolism of amniotic fluid.

References:

1. Kampbel K. Liza editor. Akusherstvo ot desjati uchitelej. 17th ed. M: Medinform agenstvo; 2004. 464 p.

2. Basjuga IO, Kostjuk VM. Strukturnofunkcional'ni osoblivosti placenti pri malovoddi vagitnih. Aktual'ni pitannja pediatrii, akusherstva ta ginekologii. 2015;16(3):668.

3. Radzinskogo VE, Milovanova AM, editors. Jekstrajembrional'nye i okoloplodnye struktury pri normal'noj i oslozhnjonnoj beremennosti. M: MI; 2005. 393 p.

4. Nikogasjan LR. Ul'trazvukove doslidzhennja fetoplacentarnogo kompleksu pri zagrozi antenatal'noï zagibeli ploda. Odes'kij medichnij zhurnal. 2012;(4):64-6.

5. Stefanov CB. Sravnenie morfologicheskih rezul'tatov po otnoshenijam kumuljat. Arhiv anatomii. 1982;82(3):91-4.

6. Gabbe S, Niebil J, Simpson J, editors. Druzin M, Smith I, Gabbe S, Reed K Antepartum fetal evaluation Obstetrics: Normal and problem pregnancies. 5th ed. Philadelphia: Churchill Uvingstone; 2007. 267-300 p. DDC-UDC 616.127-07+159.9.072

DOI:10.19221/2017412

Nesterak R.V.,

Candidate of Medical Sciences, Associate Professor, Department of internal medicine N2 and nursing, SHEE "Ivano-Frankivsk National Medical University", Ivano-Frankivsk, Ukraine, roxolana.nesterak@gmail.com

Gasyuk M.B.

Candidate of Psychological Sciences, Associate Professor, Department of General and clinical psychology, Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine

PILOT INVESTIGATION OF THE METHOD OF INTERACTIVE TRAINING OF PATIENTS AT THE STAGE OF MEDICAL REHABILITATION AND TREATMENT

Abstract. Ignoring psychosocial factors during treatment and rehabilitation of a patient with coronary heart disease often negates success in treatment and leads to the progression and occurrence of complications of the disease, repeated hospitalizations. At the stage of rehabilitation the patient needs active cooperation of a doctor and a psychologist, this can be done by applying a program of psychological rehabilitation through optimization of the internal picture of health, which will allow to evaluate the effectiveness of rehabilitation measures, and, if necessary, to make corrections to the system of knowledge obtained according to the individual characteristics of the patient. **Key words**: ischemic heart disease, acute coronary syndrome, rehabilitation, internal picture of health.

Introduction. Cardiovascular diseases rank first in the world statistics of diseases and. unfortunately, tend to increase the number of patients. Usually they occur in people of working disability, cause long-term lead age, to invalidization and cause death. According to statistical data of various countries, mortality from coronary heart disease is 15-20% of the adult population. In Ukraine, about 50 000 cases of acute myocardial infarction of the ACS with ST segment elevation (32%) and about 60% of ACS without ST segment elevations have been recorded in recent years.

An analysis of world practice shows that in recent years much attention has been paid to the progressive treatment of acute myocardial infarction, and rehabilitation of patients is important for the prevention of repeated events, the restoration of the maximum full life of the patient.

Emotional factors of "triggering" ACS are undeniable, it is emotions that are close companions of the manifestation of cardiovascular diseases, the effectiveness of treatment often depends on the emotional mood of the patient. Psychological factors are important in the etiology, pathogenesis, treatment and rehabilitation of patients after acute coronary syndrome [5].

Psychological assistance to patients in medical

institutions of Ukraine is at the stage of formation, the psychologist in the cardiology department is a rarity. At the same time, it can't be assumed that a doctor has the right to provide psychological support to a patient at any stage of treatment, the division of responsibilities between a doctor and a psychologist will improve the quality of services provided [3].

The attitude of a person to health as an internal picture of health (IPH) is one of the central, but still insufficiently developed questions of modern psychology of health. Analysis of modern psychological research has made it possible to suggest that it is quite probable to change the quality of life of the patient through a change in his attitude to himself in general, and to his health in particular [1, 2].

Objective of the study. A pilot investigation of the method of rehabilitation and rehabilitative treatment of patients after acute coronary syndrome through interactive training by optimizing the internal picture of health.

Material and methods. The objectives of the training are comprehensive support and support of patients in the medical and psychological directions, increasing the awareness of patients about cardiovascular diseases and the psychological component of diseases, improving rehabilitation and treatment of patients, by motivating them to actively participate in

rehabilitation programs and measures for secondary prevention, adherence of a patient to treatment, formation of skills and abilities of influence on behavioral risk factors, promoting health, healthy lifestyles, working with families and relatives of patients.

To improve the rehabilitation of patients with coronary heart disease, we created an author's program of psychological rehabilitation of cardiac patients by optimizing the internal picture of health.

Results of the study and their discussion. The program is based on a holistic vision of human life and an optimistic perception of its nature. The organization of psychological rehabilitation of a cardiac patient is carried out according to the 5-step strategy of counseling.

The procedure for the participation of patients in the rehabilitation program through the optimization of the internal picture of health is as patients of the rehabilitation follows: all department are recommended to choose participation in the program of psychological rehabilitation. The program is not imposed, but only recommended by a psychologist, and therefore the choice is based on personal awareness and the needs of the patient. This procedure ensures voluntary and personal interest in the work.

Cooperation with the patient takes place in the following steps: an introductory conversation, finding out the motivation for participating in the program; work in the chosen program of optimization of the internal picture of health (5 sessions of 60 minutes each) and individual psychological counseling (60 minutes) at the request of individual subjects; post-diagnostic stage. The main work with the participants of each of the programs is carried out in the form of counseling.

The doctor and the psychologist expand and deepen the knowledge of the group's participants in the form of mini-lectures, conversations, discussions, correctional exercises. As a result of the mechanisms of imitation, identification, catharsis, in group work, participants have the opportunity to learn not only on their own experience, but also on the experience of other patients. However, the shortcomings of group work are leveled by the possibility to attend additional individual consultations.

Classes are built taking into account the components of the internal picture of health, each component is considered in a separate lesson. Classes are cyclical, groups are open, every patient can join the group in the process of its activity without losing the logic of learning.

In the first lesson, the sensitive component of the internal picture of the cardiac patient's health is worked out, the actual and resource state of the patient is determined. The desire to reach a resource state is a motivation for recovery and the search for adequate rehabilitation methods.

The doctor is the bearer of real information about the potential resource condition of the patient, and the psychologist is responsible for delivering and understanding this information by the patients. The doctor tells about cardiovascular diseases, complaints and feelings which are not to be neglected by the patients with heart disease, detailed information about the risk factors for the onset and progression of the disease.

The emotional component of the internal picture of health is considered in the second lesson; on the one hand, it can be a cause of somatic disease, and on the other, may become the basis of psychological rehabilitation of the patient. Changing the attitude of the patient to the situation of the disease, to the symptom, makes it possible to activate the reserve capabilities of the organism, promote rehabilitation and recovery. An integral part of the emotional component of the inner picture of health is the emotional connection with the family, relatives.

The doctor and the psychologist act as a link between the patient and his relatives, helping them understand the specificity of the disease. The emotional component of the internal picture of health is also responsible for adherence to treatment, which is manifested in the trust in the treatment system, the doctor. Correction of the emotional state of the patient is possible with the participation, first of all, of the psychologist, and only then of the attending physician. The competent intervention of the psychologist enables the attending physician to reduce the patient's adaptation time to the disease, and also to monitor adherence to treatment throughout the treatment and rehabilitation process. The doctor explains the essence of treatment, medical manipulations and means, the importance of compliance and implementation of recommendations.

The third lesson is the work on the cognitive component of the internal picture of the cardiac patient's health. This is the recognition of the complexity of the disease, the role of psychological factors in the development of the disease, and the acceptance of the facts of the development of the disease, in particular, the prospects for recovery or the possibility of chronic disease as inevitable. Correction of the cognitive component of the internal picture of health can become the basis for choosing the optimal strategy for restoring health and rehabilitation.

The doctor provides information about the disease, in particular IHD, ACS, and the psychologist controls the acceptance and awareness of the information received, its integration into the internal picture of health.

The value-motivational component of the inner picture of health is revealed in the fourth lesson and is its core. Beliefs and internal values are strong incentives for a constructive strategy of behavior aimed at recovery, although they can provoke actions aimed at reducing the level of health. In this lesson, the conviction is formed that health is the highest value for the person himself and for his family. The strategy of a healthy lifestyle, optimizing the state of health, recovering, individual ways of rehabilitation, forming the desire to be healthy with the adoption of disease restrictions is being built.

The fifth lesson is the work on the behavioral component. The behavioral level is associated with the actualization of human activities to preserve health, this is the highest level of attitude towards health and requires the patient's activity aimed at maintaining his health.

The doctor and the psychologist conduct formation of skills and abilities of influence on behavioral risk factors; training in the skills of selfmonitoring of the state, provision of first aid.

During the individual training, each patient is identified with the most significant component. If necessary, and at the request of the patient, individual work is carried out.

At the stage of the pilot study, the effectiveness of the psychological rehabilitation

program was analyzed through the optimization of the internal picture of health at the stage of rehabilitation and restored treatment of the patient after acute coronary syndrome. Sixty-six patients with ACS with elevation of ST were who underwent examined, conservative treatment. Patients are divided into three groups depending on the rehabilitation measures carried out: a group of patients who have only traditional rehabilitation measures, a second group of patients who, along with traditional rehabilitation measures, have relaxation methods, the third group, whose participants along with traditional rehabilitation measures, underwent psychological rehabilitation through optimization of the internal picture of health. Each of the participants of the study visited 5 interactive sessions. After completing the complex of studies, the patients passed post-experimental interview.

We analyzed each component of the internal picture of health: in the group of patients who underwent psychological rehabilitation programs through optimization of the internal picture of health, improvement in the course of the underlying disease was noted, in particular, reduction in the frequency and intensity of angina attacks, improvement of exercise tolerance by increasing the distance traveled according to the test with 6-minute walking, changes in the dynamics of heart rate variability indicators according to Holter monitoring of ECG.

The results of processing self-reports of test subjects using the content analysis method make it possible to state that the program affects: a deeper understanding of the possible causes of the disease and a better understanding of the symptoms of the disease (90%); increase of motivation and adherence to treatment (80%); increased sense of confidence in the future improvement of the condition (70%); expansion of life prospects, finding new life goals (60%); improvement of well-being (40%); improvement of relations with relatives (30%); adoption of strategies for solving a complex life situation (20%), etc.

Conclusions. The results of the pilot study suggest that the presented program of psychological rehabilitation of cardiac patients by optimizing the internal picture of health is effective for the rehabilitation of patients after

acute coronary syndrome. The program contributes to a more conscious attitude to health, expand the range of knowledge about the causes of the disease, the treatment of the specifics, the treatment perspective, and promotes adherence to treatment.

Prospects for further research. The program of psychological rehabilitation of cardiac patients by optimizing the internal picture of health requires partial correction and expansion and is promising for further research and implementation.

References:

1. Vasserman LI, editor. Vasserman LI, Trifonova Vasserman LI, EA, Shhelkova OJu. Psihologicheskaja diagnostika i korrekcija v somaticheskoj klinike. Nauchno-prakticheskoe rukovodstvo. Sankt-Peterburg: Rech; 2011. 270 p.

2. Gasjuk MB, Griniv OM. Do pitannja psihoterapevtichnoï roboti z doslidzhuvanim iz psihosomatichnoju simptomatikoju. Institut psihologiï imeni GS. Kostjuka NAPN Ukrainy. Aktual'ni problemi psihologiï: Psihologija osobistosti. Psihologichna dopomoga. 2011; 11(5):125-32.

3. Kalashnik TI. Metod pozitivnoj psihoterapii v grupovoj i individual'noj psihokorekcii. Odessa; 2000. 73 p.

4. Kornac'kij VM, Moroz DM. Rannja diagnostika trivogi ta depresiï jak faktoriv riziku sercevo-sudinnoï patologiï. Ukraïns'kij medichnij chasopis. 2015;(3):80-1.

5. Mogilevich UO. Teoretiko-metodichne doslidzhennja osoblivostej psihologichnoï reabilitaciï hvorih, jaki perenesli infarkt miokarda. Medichna psihologija. 2012;(4):56-9.

6. Nikolaev EL, Lazarev EJu. Psihoterapija i psihologicheskaja pomoshh' bol'nym serdechnososudistymi zabolevanijami. Vestnik psihiatrii i psihologii. 2015;(1):57-76.

7. Brushlinskogo AV, Shapiro AZ, editors. Pezeshkian N. Psihosomatika i pozitivnaja psihoterapija. M: Institut pozitivnoj psihoterapii; 2006. 464 p. DDC-UDC 616.137.73-008.6:618.36-007.4

Pecheryaga S.V., Marinchina I.M.

Department of Obstetrics, Gynecology and Perinatology, Higher State Educational Establishment of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine

FEATURES OF HEMODYNAMIC CHANGES IN SPIRAL ARTERIES WITH LOW PLACENTATION AT THE EARLY GESTATIONAL AGE

Abstract. The article presents the results of Doppler studies in spiral arteries of indices of resistance and blood flow velocities in the I trimester of gestation in pregnant women with low placentation. As a result of the studies, a significant increase in resistance and a decrease in blood flow rates in early pregnancy in pregnant women with low placentation was found in comparison with normal placement of the chorion, which may be a factor of high risk of primary placental dysfunction development in the future. **Key words:** low placentation, I trimester of gestation, Doppler examination, spiral arteries.

Introduction. Among the causes that negatively affect the course of pregnancy and the state of the fetoplacental system, the anomalies of the implantation of the fetal egg play an important role, in particular, low placentation accompanied by insufficient functioning of the uterine-placental complex, which is caused by the character of the vascularization of the lower parts of the uterus and a decrease in the placental blood flow [2, 3]. The adequate functioning of the mother-placenta-fetus system depends primarily on the process of implantation of the fetal egg, cytotrophoblastic invasion, as well as the subsequent transformation of the spiral arteries. The results of studies carried out in recent years have shown that the formation of intrauterine suffering is laid precisely in the early gestation period, when problems in the body of a woman, the condition of the endo- and myometrium determines the inferior formation of the embryo, fetus and extraembryonic formations: amniotic fluid, umbilical cord, placenta, placental bed. Disruptions in the formation of the vascular system of the mucous membrane of the uterus is accompanied by structural changes of the latter; conditions for implantation of the fetal egg are significantly reduced. In this regard, a noninvasive study of the endometrium during blastocyst implantation is important [5]. The method of Doppler investigation of blood flow in the fetoplacental system is safe, relatively simple and at the same time highly informative in assessing its functional reserves [1, 4].

The leading role in the pathogenesis of placental dysfunction is played by disorders of uterine-placental circulation.

The constancy of the uterine-placental blood flow ensures a gestational reorganization of the spiral arteries. The physiological changes experienced by spiral arteries with the progression of uncomplicated pregnancy are characterized by elastolysis, degeneration of the muscular layer and replacement of the muscular and elastic fibrinoid shell with the expansion of the artery lumen [3].

Objective of the study. Conduct an evaluation of Doppler blood flow in the spiral arteries with low placentation.

Materials and methods. The main group of the study included pregnant women in the period from 5 to 12 weeks of pregnancy with a low location of the chorion (50 pregnant women). The control group consisted of 50 pregnant women at the same gestational age with the arrangement of the chorion in the uterine body and fundus. All the examined women of the primary and control groups were divided into 2 subgroups, depending on the gestation period (25 pregnancies in the period of 5-8 weeks of gestation and 25 women in the period of 9-12 weeks of gestation). The groups studied were representative of age, height and weight, and social employment. All were subjected to ultrasound on the apparatus «Voluson Exspert 730», to all women the location of the chorion and the fetal egg, the crown-rump length of the fetus were determined, as well as

the Doppler examination of the blood flow in the spiral arteries of the uterus. Indices of vascular resistance were calculated: the systolic-diastolic ratio (SDR), the pulsation index (PI), the resistance index (RI), as well as the pulse systolic rate (PSR), the end diastolic velocity (DV), the average distal velocity (ADV), the peak speed averaged over time (PSAT). Statistical processing of the obtained indicators was carried out by determining the Student's criteria.

Results of the study and their discussion. When analyzing the data obtained, it was found that in pregnant women with a low chorion placement at 5-8 weeks of gestation with Doppler study in spiral arteries, all resistance indices were higher: SDR-3.9 \pm 0.3, PI-0.71 \pm 0.04, RI - 1.4 \pm 0.1 compared to the control: SDR-3.0 \pm 0.3, PI-0.58 \pm 0.03, RI-1.1 \pm 0.08 (p0.05). Accordingly, blood flow velocities were lower in the main group, but the only significant difference was in the PSAT index, which in the main group vas 19.5 \pm 1.2 cm / s, and in the control group - 29.6 \pm 1.8 cm / s.

This may indicate an imperfect transformation of the walls of the spiral arteries in the abnormal position of the chorion, disorders of the first wave of invasion of the cytotrophoblast and the disrupted blood supply of the emerging placental bed. In turn, this determines the limit of uteroplacental perfusion, the inadequacy of blood flow in the intervillaceous space, where the blood flows from the spiral arteries, the stasis of blood in it and the disruption of the gas exchange process.

When evaluating Doppler indices in spiral arteries in 9-12 weeks of pregnancy, high peripheral resistance values remain in the main group, respectively, SDR-3,1 \pm 0,4; PI 0.64 \pm 0.05; RI-1,1 \pm 0,11 in comparison with the control of 2,1 \pm 0,2; 0.5 \pm 0.04; 0.82 \pm 0.04, respectively (p0.05). SDR rates by 32.2%, PI by 21.9%, and RI by 25.5% higher in women with low placentation compared with pregnant women with normal placement of chorion. So, we see that there is a preservation of high preplacental resistance of the blood flow after passing the "peak" of the first wave of involution of the cytotrophoblast.

The decrease in blood flow rates is more significant in the spiral arteries during 9-12 weeks of gestation, which is manifested by a significant decrease in SDR-25,4 \pm 1,4 cm / s, ADV-24,2 \pm 1,4

cm / s, PSAT-38,1 \pm 1.6 cm / sec in pregnant women with low chorion distribution compared with control group, where the corresponding indices make up 33.7 \pm 1.5 cm / s, 34.4 \pm 1.4 cm / s, 56.3 \pm 2, 1 cm / sec (p0.05).

Consequently, the disruption of blood flow in spiral arteries with low placentation progresses in the dynamics of pregnancy, which leads to a deepening of placental dysfunction and an increase in the level of complications of pregnancy.

Conclusions. 1. With low placentation in the I trimester of gestation the formation of highly resistant blood flow and the decrease in blood flow rates occur in the spiral arteries.

2. The revealed changes in hemodynamics in spiral arteries with low placement of chorion may be the factors of high risk of development of primary placental dysfunction in the future.

Prospects for further research. To study the parameters of volume blood flow in the chorion with abnormal placentation.

References:

1. Markin LB, Shatilovich KL, Nadorshina NE. Doplerometrija v akusherstvi: gemodinamichni osoblivosti funkcional'noï sistemi mati-placentaplid. Reproduktivnoe zdorov'e zhenshhiny. 2007; 30(1):36-9.

2. Minkina JeR. Nizkaja placentacija kak faktor riska pri beremennosti. Vestnik Rossijskogo gosudarstvennogo medicinskogo universiteta. 2008; (3):104.

3. Ponomareva NA. Prognosticheskie kriterii razvitija placentarnoj nedostatochnosti v I trimestre beremennosti. Mater 7-go Ross Foruma Mat' i ditja. M; 2005. P. 208-9.

4. Titchenko LI, Chechneva MA, Zhukova NV. Trehmernaja rekonstrukcija v I trimestre beremennosti. Rossijskij vestnik akusheraginekologa. 2003; (5):16-20.

5. Kofinas AG. Pentry M, Greiss FC. The effect of placental location on uterine flow velicity waveforms. Amer J Obster Ginecol. 2010; 159(6):1504-8.

7. Brushlinskogo AV, Shapiro AZ, editors. Pezeshkian N. Psihosomatika i pozitivnaja psihoterapija. M: Institut pozitivnoj psihoterapii; 2006. 464 p. DDC-UDC 591.481.3. + 616.005

Pschychenko V.V., Cherno V.S., Frenkel Yu.D.

Department of Laboratory Diagnostics, V.O. Sukhomlinsky Nikolayev National University, Nikolayev, Ukraine, vikylhihek@mail.ru

THE STATUS OF EXTRAORGANIC BLOOD FLOW IN PINEAL GLAND OF RATS UNDER CONDITIONS OF ACUTE STRESS AND TWENTY-FOUR HOUR DARKNESS

Abstract. Extraorganic blood flow in pineal gland of rats under acute stress and darknes is studied. The increasing functional activity of pineal gland is observed with predominance of plasma components of blood vessels.

Key words: acute stress, pineal gland, blood flow, pinealocytes.

Introduction. The epiphysis is involved in the adaptation of the organism to the changing conditions of the external and internal environment, namely it is responsible for triggering stress reactions [1-3]. Morphological criteria for assessing the functional state of the epiphysis are: the quantitative ratio of active light and low active dark pinaelocytes, the location of the active cell type in relation to the blood vessels, the compactness of the arrangement of cellular elements in the parenchyma, the morphometric parameters of the pinaleocytes (cytoplasmic area, nuclei, nucleoli), the change in the amount of condensed chromatin in the nuclei of the pineal cells, vacuolation of the cytoplasm, the state of the vascular bed and the degree of filling it with blood [4]. However, the analysis of scientific works published in recent years shows that the issues of morphology of the epiphysis under the influence of stress factors that occur at the cellular level are more studied, and the state of the vascular bed remains outside the field of view of the researchers. This is due primarily to the localization of the epiphysis in the brain, as well as its small size.

Objective of the study was to investigate the state of the vascular bed of the epiphysis of rats under conditions of acute stress and round-the-clock darkness.

Material and methods: the study was carried out on 24 mature male rats of the Wistar line, weighing 220-240 g in the autumn-winter period. Animals were kept in the vivary in the conditions of round-the-clock darkness, within 30 days.

On the thirtieth day of the experiment, the animals were modeled acute stress, by holding them for 5 hours in plastic pencil-box-like cells, in order to limit the motor activity in all directions. At the end of the experiment, the experimental animals were euthanized in strict accordance with the requirements of the provisions of the European Convention for the Protection of Vertebrates used for experimental and other scientific purposes (Strasbourg, 1986), and the "Common Ethical Principles of Animal Experiments" adopted by the First National Congress On Bioethics (Kiev, 2001). The study took place under the permission of the Ethics and Bioethics Commission of the Mykolaviv National University named after V.A. Sukhomlinsky.

After the extraction of the epiphysis along with the adjacent blood vessels, the resulting complex was immersed in a fixing solution of 10% neutral formalin. Using standard methods, the material was encased in paraffin blocks, from which sections of 4 µm thick were made and stained with hematoxylin and eosin. The histological preparations obtained in this way were studied with various magnifications of the "PrimoStarZeiss" microscope followed bv photography of the microscopic preparations with a digital SLR camera "Canon".

Results of the study and their discussion. According to the results of a histological study of preparations of the epiphysis of rats, it was revealed that in the relatively large veins, irrespective of their topographical position relative to the capsule, the stratification of blood into blood corpuscles and plasma clearly manifests itself. Both longitudinal and transverse sections of these blood vessels show clusters of blood corpuscles in the central part of the lumen of the veins. Peripheral areas of the lumen, adjacent to the walls of the blood vessel, on the histological sections look empty. It was established that blood clusters consist mainly of erythrocytes, less common are other basophilic blood corpuscles. It is characteristic that such clusters are represented, as a rule, by annulocytes. In this case, all the clusters are clearly separated from one another (Fig. 1).



Fig. 1. Micrograph of an extraorganic vein adjacent to the epiphysis capsule of a rat, under conditions of acute stress and round-the-clock darkness. Zoom: approx. × 10 vol. × 10. Coloring of hematoxylin and eosin. 1 - lumen of the vein 2 – blood corpuscles 3 parenchyma of the epiphysis; 4 - capsule of the epiphysis; 5 - vein wall.

It has been revealed that basophilic cellular elements of blood do not form clusters. They are placed between the erythrocytes chaotically, alone, almost uniformly. Throughout such venous vessels, it is sometimes possible to find focal extensions of their lumen. Basically these vessels have the same diameter. The endotheliocytes of the vascular lining are flattened and arranged in the form of a chain with identical intervals. Such morphological manifestations clearly indicate the absence of hypertension in the venous system.

It is established that in the extraorganic venous blood vessels of a smaller caliber, the morphological pattern differs from the above. It was revealed that in them the cellular elements of blood are distributed evenly in the lumen of the vessel. In this case, the basophilic cellular elements of the blood are distributed evenly in the erythrocyte mass. The latter is located throughout the lumen of the vessel approximately uniformly, occupying both the central and peripheral zones. In the erythrocyte mass, both discocytes and annulocytes are clearly visible. Moreover, these forms of erythrocytes are distributed evenly in the lumen, which indicates that there is no adhesion between them.

In the extraorganic arterial link of the circulatory system, conglomerates of erythrocyte cells are most often observed, which form individual clusters of different sizes in the arterioles. Clear boundaries are visible between these clusters of adherent erythrocytes. It was revealed that in these conglomerates there are practically no boundaries between individual red blood cells, that is, they have the appearance of homogeneous structures.

It was revealed that the lumens of arterioles are almost completely filled with such clusters of blood cells. Along with the described character of the dislocation of blood elements, a change in the wall of these blood vessels was observed. In a significant number of cases, a marked hypertrophy of the cells of the inner wall of the vessel wall is observed. Endotheliocytes appear sharply thickened, which is manifested in the change in the contours of their nuclei. The latter sharply thicken and acquire on the histological sections the ovoid form (Fig. 2).



Fig. 2. Micrograph of an extra-vessel vessel of the arterial type of the rat pineal gland in conditions of acute stress and round-the-clock darkness. Zoom: approx. × 10 vol. × 40. Coloring of hematoxylin and eosin. 1 - dark pinealocytes; 2 - arteriolar wall; 3 aggregates of erythrocytes in the arterioles lumen; 4 -

subarachnoid space; 5 - light pinealocytes. In venous microvessels of small caliber located in the immediate vicinity of the parenchyma of the epiphysis, or closely in contact with it, it is often possible to observe a slightly different arrangement of blood elements. First of all, the prevalence of the liquid part of the blood, that is, the plasma, is characteristic. The dense parts, that is, the blood corpuscles, are represented in separate groups. These groups of cells are distributed unequally along the lumen of the vessels, but they occupy mainly the peripheral zones of the lumen of the corresponding vessel. It has been revealed that in places of cell clusters, isolated red blood cells are clearly identified because of the spacing between adjacent cells (Fig. 3).

It is established that in most veins of this caliber the plasma component of blood predominates, which is manifested in histological preparations in the form of voids (Fig. 3). Erythrocytic mass in the lumen of such venous vessels often occupies a parietal or axial position. In some small veins, the erythrocytic mass occupies the entire lumen.



Fig. 3. Micrograph of pericapsular blood vessel of venous type of rat epiphysis, under conditions of acute stress and round-the-clock darkness. Zoom: approx. × 10 vol. × 20. Coloring of hematoxylin and eosin. 1 pericapsular venule; 2 - group of dark pinealocytes; 3 light pinealocytes; 4 - neuroglial cells; 5 - rames of neuroglial cells.

It has been revealed that in the subcapsular blood vessels that contact with active bright pineal cells, micropores appear through which the cytoplasm enters the vascular bed. Confirmation of this assumption can be considered as a stratification of blood into blood corpuscles and plasma.

Conclusions. Based on the results of the morphological study of the state of the escraorganic vasculature in the epiphysis of rats under conditions of acute stress and round-theclock darkness, an increase in the functional activity of the organ was revealed, which is manifested by the predominance of the plasma component of the blood in the vessels, as well as the appearance in the vascular walls of micropores, through which the cytoplasm of active light pineal cells enters vascular bed and blood is stratified into blood corpuscles and plasma.

Prospects for further research. In the future, it is planned to carry out a study of morphometric parameters of rat pinealocytes in conditions of acute stress and an altered photoperiod.

References:

1. Bejer JeV, Bulgakova AS, Skornjakov AA. Antistressovye vozmozhnosti jepifizarnogo gormona melatonina v zavisimosti ot jeksperimental'noj modeli i vyrazhennosti stressa. Medicinskij vestnik Severnogo Kavkaza. 2010;(2):59-63.

2. Pishak V.P. Struktura i funkcii shishkopodibnoi zalozi u ptahiv. Klinichna anatomija ta operativna hirurgija. 2012;11(1):101-3.

3. Sibarov DA, Kovalenko RI, Nozdrachev AD. Osobennosti funkcionirovanija pinealocitov u krys pri stresse v svetloe vremja sutok. Rossijskij fiziologicheskij zhurnal im. I.M. Sechenova. 2000;86(8):1049-57.

4. Pshichenko VV. Zmini morfo-funkcional'nogo stanu shishkopodibnoï zalozi shhuriv pri riznih vidah stresu [dis. kand. biolog. Nauk]. Mikolaïv; 2015. 162 p. DDC-UDC 611.91.013-053.13

Reshetilova N.B., Glubochenko O.V., Kulish N.M., Dudko A.G.

Higher State Educational Establishment of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine

FORMATION OF ANTERIOR CEREBRAL VESICLE CAVITIES AT THE 5TH WEEK OF THE EMBRYONIC PERIOD

Abstract. The 5th week of the embryonic period is critical in the development of the embryo due to a significant restructuring of brain structures at this stage, which can cause various shortcomings. The period of distribution of the anterior cerebral vesicle to the terminal and intermediate brains, the formation of the interventricular foramen, the formation of the pituitary gland and the complication of its structure, and the beginning of the formation of the cerebral aqueduct are those changes that most often cause developmental disorders.

Key words: anterior cerebral vesicle, embryo, brain cavity, human.

Introduction. Embryological research is of great importance for practical medicine [1,2]. The study of general and special patterns of embryo development is important for the working-out new methods for early monitoring of the correct development of the fetus and prevention of malformations [3,4,5]. On congenital the significant prospects of using these embryological studies, Academician V.V.Kupriyanov said in the eighties of the last century. To date, the relevance of all embryological research is in the antenatal prevention of fetal diseases, the methods of preand postnatal correction, as noted in many world symposia and congresses devoted to morphological sciences [6, 7].

Morphologists are interested in the implementation of new scientific ideas, the unconventionality of thinking, the breadth of practical plans, which is the source of scientific progress in the creation of priority scientific directions [8,9].

Objective of the study: to clarify the features of the formation of the cavities of the anterior cerebral vesicle.

Materials and methods: the study was carried out on 15 corpses of human embryos by methods of histological examination, preparation and morphometry.

Results of the study and their discussion: At the beginning of the 5th week, the anterior and posterior primary cerebral vesicles begin to divide

into two parts. The posterior cerebral vesicle is divided into an aniage of Pons Varoli and the cerebellum and medulla oblongata. The posterior cerebral vesicle is separated from the middle by a narrow membrane. The telencephalon and the midbrain are developing from the anterior vesicle. It appreciably increases in size in comparison with the 4-week embryo, and on the lateral surfaces protrusions forward, appear upward and backward, forming the relief of the aniage of the endbrain, namely the hemispheres. Above the protrusions, a fissure is defined that separates the caudal part of the prosencephalon from the telencephalic vesicles. In the same period of development, an orbit begins to form on the outer lateral wall of the anterior vesicle, which is separated from the rest of the vesicle by a fissure. This is the beginning of differentiation of the anterior cerebral vesicle. In the embryo of 6.0 mm parietal-coccygeal length (PCL) brain consists of five cerebral vesicles: the end, intermediate, middle, oblong and posterior. Each of these vesicles in the process of further development gives rise to a certain part of the brain.

It is at this stage that one can already speak of complications of the ventricular system as a system of the cavities of the brain. The lateral ventricles are the cavities of the end and, in part, intermediate brain, the third ventricle is the cavity of the intermediate brain and the fourth ventricle is the cavity of the medulla oblongata. Parallel with the external redistribution of the brain, amplifications occur in the system of its cavities.

Expansion in the lateral side of the cranial part of the brain cavity formed in the abovementioned protrusions, forming the hemisphere, is the beginning of the formation of the lateral ventricles. The caudal part of the cavity behind the orbit becomes the cavity of the medulla oblongata. As a result of dividing the anterior cerebral vesicle into the end and intermediate brains, one can talk about creating an interventricular opening between the third and lateral ventricles (Fig. 1). At this stage of development, these holes are still very large, but the boundary between the ventricles becomes more pronounced than the previous week.

Fig. 1 Frontal section of the embryo head PCL 6.0 mm



(figure from the preparation) 1 - cavity of the third ventricle; 2 - cavity of the lateral ventricle; 3 - an interventricular aperture.

In the place of neuropore closure, the end plate is visualized, which is the front wall of the third ventricle. In the frontal sections, the cavity of the rudiments of the lateral ventricles has the shape of a hemisphere, where the upper, lateral and lower walls differ, not having clear boundaries. The cavity of the third ventricle on horizontal sections has a cup shape due to the thickening of the lateral walls of the intermediate brain. These thickenings are the beginning of the formation of the pulvinaria.

The largest transverse dimension of the third ventricle at this stage of development reaches 0.2 \pm 0.05 mm, and the longitudinal one - 1.4 \pm 0.15 mm. The dimensions of the lateral ventricles are: transverse - 0,15 \pm 0,07 mm, and longitudinal - 0,8 \pm 0,1 mm [10].

In its anterior part, the ventral cerebral fold

considerably increases in transverse dimension. Due to the fact that it expands and contracts into the brain tissue, the space of the cerebral vesicles narrows. During this period, the forebrain reaches the greatest width and falls even lower. It forms the lower wall of the ventral cerebral fold, at the end of which the forebrain is almost adjacent to the rhomboid. The latter, in turn, is the top wall of this fold.

In embryos of 5 weeks of development in the structure of the walls of the cerebral vesicles, three layers of cells are distinguished: 1) inner core, multichannel, matrix or rudimentary; 2) light, in which there is almost no cellular elements, interstitial; 3) cell-free, or marginal layer, is clearly separated from the surrounding mesenchymal layer. The matrix rudimentary layer of cells is most pronounced in the ventral wall of the vesicles. It is partially present in the lateral ones. The thickness of the matrix on the side walls of the vesicles decreases dorsally towards the midline (Fig. 2).



Fig. 2. The frontal section of the brain of the embryo is
6.5 mm PCL. Hematoxylin-eosin. Microphoto. O. 8, ca.
7th. 1 - thalamus; 2 - closing or final plate; 3 - vessels
of the brain; 4 - matrix layer; 5 - the ultimate layer; 6 - edge layer.

During this period, the forebrain is maximally bent downwards. The oral cavity is located close to the ventral wall of the forebrain.

This week can be considered critical in the development of the embryo due to the fact that disorders that can occur during a significant restructuring of the brain structure at this stage are capable of causing birth defects [11]. The changes during which disturbances most often occur, we consider the distribution of the anterior cerebral vesicles to the end and intermediate brains, the formation of interventricular foramen, the formation of the pituitary gland and the

complication of its structure, and the beginning of the formation of the cerebral aqueduct cerebral aqueduct cerebral aqueduct cerebral aqueduct.

Prospects for further research: In further studies, attention should be paid to the development of the brain cavities in the following terms, to identify new critical periods, possible developmental defects and the working-out the new research methods.

References:

1. Vovk JuN. Klinicheskaja anatomija – osnova sovremennoj morfologii i hirurgii. Morfologija. 2016; 10(3):354-7.

2. Znamenskaja TK. Osnovnye problemy i napravlenija razvitija neonatologii na sovremennom jetape razvitija medicinskoj pomoshhi v Ukraine. Neonatologija, hirurgija ta perinatal'na medicina. 2011; 1(1):5-9.

3. Lysova PK, Nikitjuk DB, Nikolenko VN, Chava SV. Mihail Romanovich Sapin (k 85-letiju so dnja rozhdenija). In: Lysova PK, editor. Aktual'nye problemy sportivnoj morfologii i klinicheskoj anatomii. Materialy IV mezhdunarodnoj nauchnoj konferencii; 2010; M: 2010. p. 4-8.

4. Mnihovich MV. Rol' rabot N. I. Pirogova v razvitii patologicheskoj anatomii. Arhiv patologii. 2012; 74(2):59-62. 5. Mnihovich MV, Zagrebin VL. Professor AG. Knorre: zhizn' i nauchno-pedagogicheskaja dejatel'nost'. Morfologija. 2014; 8(4):85-91.

6. Moldavskaja AA. Perspektivy razvitija nauchnyh issledovanij po morfologii Fundamental'nye issledovanija. 2004;(1):96-7.

7. Smirnov AV, Krajushkin AI, Perepelkin AI. Nejroanatomija. Volgograd; 2013.

8. Sapin M.R. Chto znaet anatomija o proishozhdenii cheloveka? Morfologija. 2013; 143(2):86-9.

9. Sapin M. R. Segodnja i zavtra morfologicheskoj nauki. Morfologija. 2009; 117(3):6.

10. Fukusumi A, Okudera T, Takahashi S, Taoka T, Sakamoto M, Nakagawa H, Takayama K, at al. Anatomical evaluation of the dural sinuses in the region of the torcular herophili using three dimensional CT venography. Acad Radiol. 2010 Sep; 17(9):1103-11.

11. Tel'cov AP, Romanova TA, Dobrynina IV. Harakteristika kriticheskih faz razvitija cheloveka i zhivotnyh v ontogeneze. Morfologija. 2008; 133(2):132-133. DDC-UDC 616-056.7+ 616

Riznichuk M.O., Galitskaya V.O., Dyhodyuk Yu.V., Kravchuk Yu.V., Vakaryuk O.V.

Department of Pediatrics and Medical Genetics, Higher State Educational Establishment of Ukraine "Bukovinian State Medical University", Chernivtsi, Ukraine, rysnichuk@mail.ru

PRADER-WILLI SYNDROME, DIAGNOSTICS AND CURRENCY FEATURES

Abstract. Five boys with Prader-Willi syndrome were examined at the endocrinologist by 2016. All children had minimal diagnostic signs of the syndrome, namely: muscular hypotension, hypogonadism, obesity, mental retardation of varying severity, small hands and feet. In two children there was a disruption of glucose tolerance. All patients had the manifestation of hypergonadotropic hypogonadism. If a minimal diagnostic criteria are found in the newborn, a genetic analysis is necessary. **Key words**: Prader-Willi syndrome, obesity, children, hypogonadism.

Introduction. The Prader-Willi syndrome (PWS) was first described by the Swiss pediatricians A. Prader and H. Willi in 1956. Its frequency in the world is 1 per 25,000-10,000 newborns.

The Prader-Willi syndrome arises from the deletion of the parent copy of the imprinted **SNRPN** gene of the small nuclear ribonucleoprotein N polypeptide and the necdin gene, which is adjacent to the mRNA clusters SNORD64, SNORD107, SNORD108 and two copies of SNORD 109, 29 copies of SNORD116 (HBII-85) and 48 copies SNORD115 (HBII-52). They are located on the 15th chromosome in the region 15q11.2-q13. This is the so-called PWS / AS region, which can be lost as a result of the action of one of several genetic mechanisms in most cases as a result of mutations. There are other more rare mechanisms of development of this syndrome: maternal isodisomy, that is, when both chromosomes 15 are obtained from the mother, random mutations, chromosomal translocations and gene deletions [5, 7].

The risk of the birth of a sick child in a family where there is already one patient is completely dependent on the genetic mechanism that caused the disorder. The probability of a sick child's birth is less than 1% if he has a gene deletion or isodisomy, but if the child has a mutation of the region, which is characterized by the phenomenon of imprinting, then the risk rises to 50%, in the case of chromosomal translocations, the occurrence of the disease can be predicted in the next child in 25%. For the diagnosis of all known mechanisms, prenatal testing should be used [1].

Children with Prader-Willi syndrome usually are born full-term with insignificant intrauterine hypotrophy, often in asphyxia, 10-40% previa gluteus. There are two phases of the syndrome [2]. The first is inherent in children of 12-18 months. Immediately after birth, severe muscle hypotension is noted. The symptom is very pronounced, children do not make spontaneous movements and can not suck. As a result, the formation of static and locomotor functions is sharply delayed: they do not hold their heads, they do not sit. The physiological reflexes of the newborns are decreasing or absent: Moro's reflex, step reflex, and Bauer's response. There is also a tendency to hypothermia. There are other anomalies: a high, narrow forehead; almondshaped incision of the eye slits with thin, drooping eyelids; skin and hair are lighter than all other family members have, hypopigmentation of the iris (in 75% of cases); microdontia, hypoplasia of the cartilages of the auricles, scoliosis, ectropion (eyelid eversion), glaucoma. The second phase of the disease develops in a few weeks, months or until the end of the first - the beginning of the second year of life. Hypotension gradually decreases and bulimia develops: the child constantly experiences hunger, actively searches for food and, as a result, obesity develops.

Subcutaneous fatty tissue is distributed unevenly, most of it on the trunk and proximal parts of the limbs - hips, shoulders. The feet and hands are disproportionately small. This phase begins to attract attention to mental retardation [3]. Hypogonadism is also characteristic. Typically, patients also have a deficiency in FSH and LH secretion, which can lead to a delay in puberty and underdevelopment of the sex glands [4]. In boys, hypoplasia of the penis is observed, in girls hypoplasia of large and small labia and in 50% of cases - the uterus. Further development of diabetes is characteristic. In the blood biochemistry there are no abnormalities [6].

Differential diagnosis is performed with other syndromes accompanied by severe muscle hypotension, delayed psychomotor development (myopathy, spinal amyotrophy, Opitt-Frías syndrome) with obesity syndromes (Lawrence-Moon-Barde-Biddle, Alström, Cohen syndrome, adiposogenital dystrophy, etc.) 8].

Objective of the study was to analyze the course of the Prader-Willi syndrome in children of the Chernivtsi region.

Material and methods. Five children with Prader-Willi syndrome were examined, who were on the endocrinologist's monitoring in 2016.

Results of the study and their discussion. All children with this disease were male. Up to a year, the diagnosis is made for two children (40%), up to 4 years also for two, and one child for 14 years. All children had minimal diagnostic signs of the syndrome, namely: muscle hypotension, hypogonadism, obesity, mental retardation of varying severity, small hands and feet.

General clinical tests showed no abnormalities. Two children had a disruption of glucose tolerance, which was proved with a glucose tolerant test. Biochemical blood test did not show any other abnormalities.

Three children had a true bilateral cryptorchidism. So, as in all patients hypogonadism was clinically diagnosed, in all children the level of sex hormones was studied.

The level of hormones in children was: FSH -14.04 mlOd / ml, testosterone 1.1 ng / ml, LH -12.6Mod / ml, that is, hypergonadotropic hypogonadism was detected.

All children underwent ultrasound of the thyroid gland. Also, children with suspected autoimmune thyroiditis were assessed for TSH, T3

and T4 levels and the detection of antibodies to thyroid peroxidase. Two children confirmed the diagnosis of "autoimmune thyroiditis, hypertrophic form, euthyroidism."

Two children had short-sightedness and one child suffered from spinal amyotrophy of Wernig-Hoffmann.

All patients received the following treatment: massage, exercise therapy, monitoring changes in the musculoskeletal system, correction of nutrition and cognitive abnormalities, treatment of endocrinological pathology, surgical interventions.

Conclusions. If a child has a low weight and height in the case of full term pregnancy at birth; gluteus. some microanomalies previa of development; pronounced hypotension of the muscles, reduced pigmentation of the skin, iris of the eyes and hair, it is recommended to perform molecular-genetic testing by the FISH method to microdeletion detect the of the 15th chromosome.

Prospects for further research. To study the features of genetic disorders in children of the Chernivtsi region with the Prader-Willi syndrome.

References:

1. Peterkova VA, Vasjukova OV. Redkie formy ozhirenija. Lech vrach. 2008;(3):29-33.

2. Jarygina SV, Sergeev JuS, Shabalov NP. Aktual'nost' i vozmozhnosti rannej diagnostiki sindroma Pradera-Villi. Pediatrija. 2006;(6):117-20.

3. Yearwood EL, McCulloch MR, Tucker ML, Riley JB. Care of the patient with Prader-Willi syndrome. Medsurg Nursing. J Adult Health. 2011; 20(3). P. 113-122.

4. Emerick JE, Vogt KS. Endocrine manifestations and management of Prader-Willi syndrome. Int J Pediatr Endocrinol. 2013; 1(14). doi: 10.1186/1687-9856-2013-14.

5. Ho AY. Clinical management of behavioral characteristics of Prader-Willi syndrome. J Neurops Dis Treat. 2010; 6:107-18.

6. Lionti T, Reid SM, Rowell MM. Prader-Willi syndrome in Victoria: mortality and causes of death. J Paediatr Child Health. 2012;48(6):506-11.

7. Wattendorf D, Muenke M. Prader-Willi syndrome. Am Fam Phys. 2005;.72(5):827-30.

8. Zipf WB. Prader-Willi syndrome: the care and treatment of infants, children, and adults. Adv Pediatr. 2004; 51:409-34.

DDC-UDC 616.12-008.1+613.96+546.15+546.72

DOI:10.19221/2017417

Shalamay U.P.,

Department of the General Practice (Family Practice), Physical Rehabilitation and Sports Medicine, Ivano-Frankivsk National Medical University, Ivano-Frankivsk, Ukraine

Pavlikivska B.M.,

Department of Pediatric Surgery and Propaedeutic Pediatrics, Ivano-Frankivsk National Medical University, Ivano-

Frankivsk, Ukraine

Voronich-Semchenko N.M.

Doctor of medical sciences, professor, chief of the Department of Physiology, Ivano-Frankivsk National Medical University, Ivano-Frankivsk, Ukraine, voronich@meta.ua

THE STATE OF AUTONOMOUS HEART REGULATION IN ADOLESCENTS WITH LIGHT IODINE DEFICIENCY AND LATENT IRON DEFICIENCY

Abstract. The variability of heart rate in teenagers (12-18 years) with latent iron deficiency, light iodine deficiency, in conditions of their combination and in healthy coevals (control group) was examined. Thyroid status was characterized by the content of free triiodothyronine (fT_3) and thyroxine (T_4), thyroidstimulating hormone of adenohypophysis (TSH), content of iodine in urine. The iron metabolism was evaluated by the content of hemoglobin in capillary blood, level of serum iron and serum ferritin, serum iron binding capacity. The development of latent hypothyroidism in girls and boys with isolated iodine deficiency, combined iodine and iron deficiency was found. A significant decreasing of hemoglobin content, serum iron and ferritin on the background of increasing the iron binding capacity of serum in examined children of 3-rd and 4-th groups to the analogical data in a healthy coevals. In children of control group a balanced influence of sympathetic and parasympathetic divisions of the autonomic nervous system was detected. In children with light iodine deficiency the intensity of mechanisms of autonomic regulation. In boyd and girls with combined deficiency of microelements the increasing of parasympathetic effects, that is shown by the rise of indexes of rMSSD (on 25.6-52.2%, p₁₋₄ <0.05), pNN50(%) (on 56.5-61.0 %, $p_{1-4}<0.05$), HF (in 42.9-60.7%, $p_{1-4}<0.05$) on the background of reduction the ratio LF/HF (on 41.6-57.6%, p_{1-4} <0.05) to analogical control data. Latent iron deficiency significantly potentiates the narrowing of adaptation and reserve possibilities of organism of children with light *iodine deficiency.*

Key words: heart rate variability, light iodine deficiency, latent iron deficiency, thyroid status, iron metabolism, teenagers.

Introduction. The main factor in the disruption of the functional capacity of the thyroid gland is iodine deficiency in the environment. In recent years, there has been an increase in the number of cases of hypothyroid pathology and its complexity is increasing [1, 8]. The reasons for this trend may be the inadequacy of preventive measures, the detection of pathology at the stages of preclinical changes and the influence of other goitrogens. It contributes to an increase in the incidence of significant man-made stress, deficiency of essential (selenium, iron) and excess of toxic (cadmium, chlorine) trace elements [4, 8]. Of particular interest is the elucidation of regulatory and adaptive capabilities of the organism at preclinical stages of microelement imbalance. The study is conducted due to the high probability of forming a combined micronutrient deficiency in the regions of goiter endemia, excessive sensitivity to trace elements in children and adolescents.

The objective of the study: to evaluate the effect of mild iodine deficiency and latent iron deficiency on the functional state of autonomic regulation in adolescents.

Materials and methods of research. Thirty-six practically healthy adolescents (33 boys and 32 girls) aged 12 to 18 years were divided into four groups: the first (n = 17) - boys and girls with the proper exchange of iodine and iron (control

group) 2nd (n = 16) - children with mild iodine deficiency, 3rd (n = 16) - children with latent iron deficiency, 4- (n = 16) - boys and girls with mild iodine deficiency and latent iron deficiency.

The level of provision of the body with iodine was evaluated on the basis of the data of microelement excretion in urine, the median of ioduria was found [1, 4, 8]. Thyroid status was characterized by the content of free triiodothyronine (fT3) and thyroxine (fT4), the thyroid-stimulating hormone of adenohypophysis (TSH) (test kit "DRG", Germany), [1, 4, 8]. The exchange of iron was assessed by hemoglobin content in capillary blood, serum iron level, ironbinding capacity of serum (test kit "Cormay", Poland). The state of the iron depot was characterized by the level of serum ferritin (SF) (chemiluminescent method using the Immulite 2000 test system of the USA) [5]. The status of AHR in children was assessed by analyzing heart rate variability (HRV). The survey was conducted on the device "Poly-Spectrum.NET" (Neurooft, Ukraine). Studies were conducted in the morning (from 9 to 12 hours), on an empty stomach, lying down and standing after a 15-minute rest in a horizontal position (to adapt to the survey conditions). The ECG was recorded for 5 minutes. ECG data were analyzed in an automatic mode using a program to determine the spectral parameters of the heart rate according to the Rate Variability, the Standards Heart of Measurement, the Physiological Interpretation and Clinical Use, the Task Force of the European Society of Cardiology of North American Society [9]. The physiological aspects of autonomic dysfunction were evaluated by such parameters of the rhythmogram: SDNN (standard deviation of normal NN intervals), rMSSD (quadratic root of the sum of the squares of the difference in the values of the consecutive pairs of NN intervals, depends on the activity of the parasympathetic department of the ANS), pNN50% (the percentage of pairs of consecutive intervals, Which differ more than 50 ms), mode (Mo), mode amplitude (AMO), variation range (BP), voltage index (IN). Spectral analysis was performed by recording the following indices: LF (spectrum power at 0.05-0.15Hz, characterized mainly by the attractive ANS section), LFn% (low frequency wave fraction), HF (spectrum power at 0.15 -0.4Hz, reflects the activity of the parasympathetic of ANS), HFn% (fraction of high-frequency waves), LF / HF - ratio of low- and high-frequency components [9]. Studies were conducted in successive representative groups of observations. Statistical analysis of the data was carried out using the package of mathematical programs StatisticSoft 7.0. Statistically significant difference was considered when p <0.05.

Results of the study and their discussion. As a result of the examination, the development of latent hypothyroidism in schoolchildren of the 2 nd and 4 th groups was diagnosed (Table 1). A significant decrease in the content of hemoglobin, serum iron and ferritin in the examined children of the 3rd and 4th groups was found with respect to similar data in healthy peers (Table 1).

Members of the control group maintained a balanced influence of sympathetic and parasympathetic parts of the autonomic nervous system (ANS) in a horizontal position, disrupted when taking a vertical position (tab. 2).

In boys of the 2nd experimental group, the growth of rMSSD (47.8-56.8%, p1-2 <0.05), AMo (66.7%, p1-2 <0.05), TI (2.7 times, p1-2 <0.05), HF (43.9%, p1-2 < 0.05) against the background of Mo decrease (by 14.6%, p1-2 < 0.05), LF (by 41.7%, p1-2 < 0.05) for similar control data (Table 3). A similar trend of changes in indicators was found when changing the position of the body (standing). Such indicate the tension dynamics may of autonomous regulation mechanisms even for children with mild iodine deficiency.

In the 3rd group survey, most of the HRV indices did not differ significantly from that of healthy peers (Table 4).

In boys and girls with combined deficiency of trace elements, an increase in parasympathetic effects was observed, as indicated by an increase in rMSSD (25.6-52.2%, p1-4 <0.05), pNN50% (by 56.5-61.0 %, P1-4 <0.05), HF (42.9-60.7%, p1-4 <0.05) against LF / HF (41.6-57.6%, p1 -4 <0.05) relative to similar control data (Table 5).

Considering the presence of significant changes between the 2nd and 4th experimental groups (Mo), the 3rd and 4th experimental groups (rMSSD, pNN50%, IH, LF, HF, LF / HF) one can clearly speak of the significant depletion of adaptation reserves under the condition of combined microelement imbalance.

Ĕ
Ð
•••
-
<u>ج</u>
<u>u</u>
<u>ک</u>
(D
വ
-
ັ
~
=.
5
+
÷
Ĩ
(D
<u> </u>
0
=
0
Ž
<
Ξ.
~
UЧ
<u>+</u>
ھ
Р
Ē
<u> i b</u>
5
$\overline{\mathbf{O}}$
-
5
≤.
<u>_</u> +
5
~
₽
ല
σ
÷.
0
5
7
1
-
ĭ.
<u>u</u>
പ്
≝_
S
S
+
5
Ē
=:
Ð
÷
<
C
≚:
Ŧ
Ę
<u>u</u>
2
1
_
nc
nce
nce k
nce be
nce bet
nce betv
nce betw
nce betwe
nce betwee
nce between
nce between [.]
nce between tl
nce between th
nce between the
nce between the r
nce between the re
nce between the res
nce between the resp
nce between the respe
nce between the respec
nce between the respect
nce between the respective
nce between the respectiv
nce between the respective
nce between the respective g
nce between the respective gr
nce between the respective gro
nce between the respective grou
nce between the respective group
nce between the respective groups

z

Indices of thyroid sy	ystem and	iron metab	olism of childrei de	n with mild iodii ficiency imbalar	ne deficiency, la nce (M + m)	tent iron defici	ency and com	Table 1 bined iodine and iron
	1 st group	(control)	2 nd group		3 rd group		4 th group	
Indices	Boys	Girls	Boys	Girls (n=8)	Boys	Girls (n=8)	Boys	Girls (n=8)
	(n=9)	(n=8)	(n=8)		(n=8)		(n=8)	
Free	3,86±	3,73±	3,16±0,25	3,18±0,12	3,37±0,25	3,13±0,21	3,12±0,22	3,11±0,19
triiodothyronine	0,11	0,24	p ₁₋₂ <0,05				p ₁₋₄ <0,05	
(fT3) (nmol/l)								
Free thyroxine	1,83±	1,82±	1,65±0,04	$1,66 \pm 0,05$	1,72±0,06	1,74±0,07	1,62±0,06	1,63±0,07
(fT₄), нмоль/л	0,06	0,05	p ₁₋₂ <0,05				p ₁₋₄ <0,05	
Thyroid-	1,77±	1,92±	3,34±0,26	3,34±0,29	$1,55\pm0,14$	2,15± 0,24	3,33±0,23	3,42±0,31
stimulating	0,15	0,28	p ₁₋₂ <0,001	p ₁₋₂ <0,01			p ₁₋₄ <0,001	p ₁₋₄ <0,01
hormone (TSH), mcMO/ml								
Median of	102,21±	102,11±	71,44±5,29	81,52±5,34	102,52±4,54	101,25±3,65	78,03±6,75	72,04±6,34
ioduria, mcg/l	4,06	3,96	p ₁₋₂ <0,01	p ₁₋₂ <0,05			p ₁₋₄ <0,05	p ₁₋₄ <u,u1< td=""></u,u1<>
	145,32±	128,25±	151,23± 6,32	125,34± 3,05	118,53± 2,94	116,54±2,43	114,54	113,32±2,08
Hemoglohin g/l	6,37	5,24			p ₁₋₃ <0,01		±2,52	p ₁₋₄ <0,05
					p ₂₋₃ <0,01		p ₁₋₄ <0,01 p ₂₋₄ <0,01	p ₂₋₄ <0,05
Serum iron level,	18,48±	19,04 ±	14,73±0,66	15,51± 0,92	11,72±0,95	12,13±0,85	10,02±0,66	11,74±0,91
mcmol/l	0,93	0,98	p ₁₋₂ <0,05	p ₁₋₂ <0,05	p ₁₋₃ <0,001	p ₁₋₃ <0,01	p ₁₋₄ <0,01	p ₁₋₄ <0,01
					p ₂₋₃ <0,05	p ₂₋₃ <0,05	p ₂₋₄ <0,01	p ₂₋₄ <0,05
Iron-hinding	56,75±	50,64±	56,71±3,49	51,72±2,96	66,05±3,53	66,32±5,11	69,56±4,76	68,84±5,19
capacity, mcmol/l	6.41	4,12				p ₁₋₃ <0,05		p ₁₋₄ <0,05
Corum forritin	53,71±	41,45±	37,95±5,92	31,81±3,45	29,92±3,51	23,43±4,57	27,32±5,01	21,61±3,54
(SF), ng/ml	7,45	3,07			p ₁₋₃ <0,05	p ₁₋₃ <0,05	p ₁₋₄ <0,05	p ₁₋₄ <0,01

Table 2

	1 st group (control)								
Indices	Воу	/s n=8	Girls n=8						
	In lying position	In vertical	In lying position	In vertical					
		position		position					
SDNN, ms	70.51±5.21	117.52±4.36*	70.53±3.52	95.32±2.36*					
rMSSD,msc	68.23±7.72	36.21±4.23*	52.52±5.36	62.56±6.23					
pNN50, %	7,74±0.51	8.520.82	6,81±1.16	8.080,38					
Mode (Mo), s	0,85±0,07	0,48±0,02*	0,82±0,04	0.63±0,04*					
Mode amplitude (Амо), %	34,57±2,71	61,69±6,82*	24,51±3,45	35,23±3,51					
Range (Dx), s	0,36±0,03	0,27±0,04	0,37±0,06	0,34±006					
Tension index (TI), st. unit	49,22±4,51	195,21±11,35*	44,12±8,24	112,64±24,16*					
0.04-0.15 Hz LF, ms	1011,43±95,15	2554,33±415,33*	1233,24±130,12	1591,23±154,32					
0.04-0.15 HzLF, %	37,25±3,34	71,25±4,15*	43,53±4,23	69,06±5,61*					
0.15-0.4 Hz HF, ms	1003,11±101,26	524,34±57,86*	761,89±50,46	519,32±24,12*					
0.15-0.4 Hz HF, %	43,62±4,02	21,73±2,04*	36,63±3,82	22,71±2,43*					
LF/ HF ratio	1,13±0,19	4,77±0,64*	1,03±0,12	4,01±0,9*					

Indices of cardiac rhythm variability for healthy school-age children (M + m)

Note: here and in the following tables * is the likely difference between the respective groups.

Table 3

Heart rate variability indices for school-age children with mild iodine deficiency (M + m)

	2 nd gro	oup (children with th	e mild iodine deficiency)			
Indicos	Воу	s n=8	Girls	s n=8		
muices	In lying position	In vertical	In lying position	In vertical		
		position		position		
SDNN, ms	80.23±3.49	104.62±9.69*	87.37±3.94	104.62±10.89		
			p ₁₋₂ <0,05			
rMSSD, ms	81.52±8.23	53.52±5.23*	70.23±6.74	45.37±3,23*		
		p ₁₋₂ <0,05		p ₁₋₂ <0,05		
pNN50, %	8,74±0.82	9,41±1,04	7,21±0.81	8,35±0.91		
Mode (Mo), s	0,87±0,07	0,57±0,06*	0,70±0,02	0,51±0,03*		
			p ₁₋₂ <0,05	p ₁₋₂ <0,05		
Mode amplitude	33,56±4,51	45,91±5,34	40,85±4,13	55,15±6,21		
(Амо), %			p ₁₋₂ <0,05	p ₁₋₂ <0,05		
Range (Dx), s	0,41±0,05	0.20±0,03*	0,30±0,06	0,19±0,02		
				p ₁₋₂ <0,05		
Tension index (TI), st.	62,12±5,51	155,33±45,52*	121,31±31,71	264,37,±44,36*		
units			p ₁₋₂ <0,05	p ₁₋₂ <0,05		
0.04-0.15 Hz LF, ms	897,11±83,56	1788,63±235,34*	719,23±98,23	1068,42±176,63		
			p ₁₋₂ <0,05	p ₁₋₂ <0,05		
0.04-0.15 Hz LF, %	40,51±3,82	72,51±3,71*	49,38±4,43	74,32±2,64*		
0.15-0.4 Hz HF, ms	1397,21±132,23	488,84±55,43*	1096,42±130,25	525,21±30,61*		
	p ₁₋₂ <0,05		p ₁₋₂ <0,05			
0.15-0.4 Hz HF, %	50,56±,5,22	19,21±1,92*	47,23±4,52	18,05±1,42*		
LF/ HF ratio	0,77±0,1-	3,23±0,43*	0,72±0,08	3,38±0,32*		

Table 4

Indices of heart rhythm variability for school-age children with latent iron deficiency (M + m)

	3 rd g	group (children with	latent iron deficiency)			
Indicos	Воу	s n=8	Girls n=8			
multes	In lying position	In vertical	In lying	In vertical		
		position	position	position		
SDNN, ms	71.81±6.81	120.23±12.72*	80.17±9.02	100.639.12		
rMSSD, ms	40.63±4.91	42.56±3.56	37.67±4.76	38.81±3.21		
	p ₁₋₃ <0,05		p ₂₋₃ <0,01	p ₁₋₃ <0.01		
pNN50, %	7.320.78	7.890.69	6.330.62	7.180.72		
Mode (Mo), s	0,85±0,09	0,60±0,08	0,73±0,04	0,57±0,05*		
Mode amplitude (Amo),	30,45±4,13	46,72±5,32*	34,80±5,04	46,65±3,91		
%						
Range (Dx), s	0,44±0,07	0,39±0,06	0,27±0,04	0,38±0,03		
Tension index (TI), st.	37,24±4,42	168,58±13,54*	66,61±8,53	129,01±10,29*		
units	p ₂₋₃ <0,01			p ₂₋₃ <0,05		
0.04-0.15 Hz LF, ms	1003,25±170,24	1696,61±149,22*	924,25±92,12	1456,12±115,31*		
0.04-0.15 Hz LF, %	44,55±3,24	48,52±5,25	45,21±3,71	53,24±6,32		
		p ₁₋₃ <0,05				
0.15-0.4 Hz HF, ms	1133,32±123,74	484,25±31,01*	641,42±60,21	677,52±61,36*		
			p ₂₋₃ <0,05	p ₁₋₃ <0,05		
0.15-0.4 Hz HF, %	46,52±3,53	23,75±3,61*	38,46±3,23	32,64±3,31		
				p ₁₋₃ <0,05		
LF/ HF ratio	0,85±0,11	3,49±0,48*	1,60±0,23	5,81±0,86*		
			p ₂₋₃ <0,05			

Table 5

Indices of heart rhythm variability for school-age children with mild iodine deficiency and latent iron deficiency (M + m)

	4 th group (mild iodine deficiency and latent iron deficiency)					
Indiaas	Boys	n=8	Girls n=8			
multes	In lying position In vertical		In lying position	In vertical		
		position		position		
SDNN, ms	86.81±6.81	102.23±12.32	102,52±13,02	123.75±12.13		
			p ₁₋₄ <0,05	p ₁₋₄ <0,05		
rMSSD, ms	85.74±8.43	55.11±4.81*	72.51±6.32	44,23±4.62*		
	p ₃₋₄ <0,01	p ₁₋₄ <0,05	p ₁₋₄ <0,05	p ₁₋₄ <0,05		
			p ₃₋₄ <0,01			
pNN50, %	12,46±1.92	9,89±0,91	10,66±0.42	12.43±1,39		
	p ₁₋₄ <0,05		p ₁₋₄ <0,05	p ₁₋₄ <0,05		
	p ₃₋₄ <0,05		p ₃₋₄ <0,001	p ₃₋₄ <0,01		
Mode (Mo), s	0,66±0,04	0,61±0,05	0,64±0,04	0,50±0,04*		
	p ₁₋₄ <0,05	p ₁₋₄ <0,05	p ₁₋₄ <0,05	p ₁₋₄ <0,05		
	p ₂₋₄ <0,05					
Mode amplitude	e 43,35±5,25 62,61±		38,52±4,04	49,56±5,12		
(Амо), %			p ₁₋₄ <0,05	p ₁₋₄ <0,05		
Range (Dx), s	0,58±0,08	0,41±0,06	0,28±0,05	0,22±0,04		
	p ₁₋₄ <0,05	p ₁₋₄ <0,05				
		p ₂₋₄ <0,05				

Tenstion index (TI), st.	67,73±6,53*	149,81±16,05*	142,59±29,16	189,92±19,01
units	p ₁₋₄ <0,05	p ₁₋₄ <0,05	p ₁₋₄ <0,05	p ₁₋₄ <0,05
	p ₃₋₄ <0,01		p ₃₋₄ <0,05	
0.04-0.15 Hz LF, ms	849,23±70,24	1185,36±159,25	804,25±96,23	1013,36±141,64
		p ₁₋₄ <0,05	p ₁₋₄ <0,05	p ₁₋₄ <0,05
		p ₃₋₄ <0,05		p ₃₋₄ <0,05
0.04-0.15 Hz LF, %	45,26±4,92	56,34±2,21	52,72±3,46	72,28±6,62*
		p ₁₋₄ <0,05		
0.15-0.4 Hz HF, ms	1433,75±128,74*	534,71±60,13*	1224,42±108,54*	503,52±51,12*
	p ₁₋₄ <0,05		p ₁₋₄ <0.01	
			p ₃₋₄ <0,01	
0.15-0.4 Hz HF, %	53,16±4,91	30,66±2,14*	49,84±4,03	20,64±2,14*
		p ₁₋₄ <0,05	p ₁₋₄ <0,05	
		p ₂₋₄ <0,01		
LF/ HF ratio	0,66±0,07	2,41±0,44*	0,69±0,07	1,70±0,12*
	p ₁₋₄ <0,05	p ₁₋₄ <0,05	p ₁₋₄ <0,05	p ₁₋₄ <0,05
			p ₃₋₄ <0,01	p ₃₋₄ <0,01

Таблиця №5 (продовження)

Conclusions. Deficiency of iodine results in disturbances of autonomic regulation of the heart. Latent iron deficiency significantly potentiates the narrowing of the adaptive and reserve capacities of the schoolchildren with mild iodine deficiency.

Prospects for further research. Investigation of the dynamics of indicators of HRV with age, possibilities of restoration of adaptation reserves of pupils in conditions of therapy with trace elements.

References:

1. Yerohina OI. Kliniko-patogenetichni aspekti jododeficitnih zahvorjuvan' u ditej shkil'nogo viku v umovah legkoï jodnoï endemiï [avtoref. dis. na zdobuttja naukovogo stupenja kand. med. nauk]. Harkiv: Harkivs'ka medichna akademija pisljadiplomnoï osviti; 2008. 20 s.

2. Kovalenko SO, Kudij LI. Variabel'nist' sercevogo ritmu. Metodichni aspekti. Cherkasi: Cherkas'kij nacional'nij universitet im. B. Hmel'nic'kogo; 2016. 269 p.

3. Lezhenko GO, Pashkova OYe. Vegetativni disfunkcii u ditej. Ditjachij likar. 2011; (4):20-32.

4. Mamenko MYe. Poyednannia deficitu jodu ta zaliza u ditej molodshogo shkil'nogo viku. Suchasna pediatrija. 2008;(5):78-81. 5. Marushko JuV, Lisochenko OO. Zalizodeficitni stani u ditej na suchasnomu etapi Sovremennaja pediatrija. 2011; (1):84-88.

6. Popov VV, Fritshe LN. Variabel'nost' serdechnogo ritma: vozmozhnosti primenenija v fiziologii i klinicheskoj medicine. Ukraïns'kij medichnij chasopis. 2006;52(2):24-31.

7. Senatorova GS, Maciyevs'ka NK. Pokazniki variabel'nosti sercevogo ritmu u stani spokoju ta pri ortoprobi u junakiv 14-18 rokiv z sercevosudinnoju patologieju. Tavr med-biol vestnik. 2009; 12.2(46):56-9.

8. Baloh Z, Carayon P, Conte-Devolx B. Laboratory medicine practice guidelines. Laboratory support for the diagnosis and monitoring of thyroid disease. Thyroid. 2008; 13(1):120-6.

9. Voronych S. Pavlykivs'ka B, Voronych-Semchenko N. Physiological aspects of analysis of heart rate variability parameters in adolescents with latent hypothyroidism. Interernational journal of physiology and pathophysiology. 3(1):59-68. DDC-UDC 616-001.2-092.18/.19-092.9

DOI:10.19221/2017418

Shutova N.A.,

Candidate of Medical Sciences, Assistant professor, Department of Physiological Pathology, Kharkiv National Medical University, Kharkiv, Ukraine, md.shutova@mail.ru

Nikolayeva O.V.,

Doctor of Medical Sciences, Professor, Head of Department of Physiological Pathology, Kharkiv National Medical University, Kharkiv, Ukraine, ovnikolayeva@mail.ru

Sulkhdost I.O.

Candidate of Medical Sciences, Assistant professor, Department of Physiological Pathology, Kharkiv National Medical University, Kharkiv, Ukraine, sulhdosti@mail.ru

ELECTROMAGNETIC RADIATION IMPACT ON THE CELLULAR PROTTECTIVE MECHANISMS IN EXPERIMENT

Abstract. The work examines the changes of activity of antioxidant system of the adrenal glands and thyroid gland of rats in different ages against the ground of influence of EMR in the range 895-905 MHz. The dependence between the increase of its activity and the age of the animals was determined. A possible pathogenic mechanism of the influence of EMR on the cell membrane is described. **Key words:** EMR, endocrine glands, antioxidant system.

Introduction. In recent decades due to quick introduction and spread of devices generating electromagnetic radiation (EMR) on many territories of European countries voltage of magnetic fields has increased promoting the origin of such a notion as electromagnetic environmental pollution. Therefore today EMR is considered as a pathogenic exogenous factor which mechanisms of influence on biological objects are not studied completely.

The analysis of literary evidences demonstrates that EMR of different intensity induces rather wide spectrum of biological effects. First, it is thermal action, which signs depend on structural and functional properties of the tissue itself. Second, the mechanisms of EMR resonance action on the cells are determined [1, 2]. Against the ground of chronic influence of EMR on biological membranes the activation of lipid peroxide oxidation (LPO) is known to occur, when a number of free radicals are formed [3]. These compounds act as aggressive oxidants provoking damage of the vital bodv structures, stimulating development of oxidative stress and provoking development of inflammatory processes. These damages on the cellular level are the bases for further destabilization of general homeostasis affecting disorders of the regulating functional links of the whole integrate body systems nervous, endocrine, immune etc.

Antioxidant system (AOS) insures one of the first lines of protection of cells against an

aggressive effect of free radicals. The list of the most informative indices of AOS having practical clinical-biochemical value includes superoxide dismutase (SOD), catalase, glutathionedependent peroxidase etc. [4]. Determination of their content can be a sign of an aggressive factor degree affecting a living organism.

Objective: to determine changes of AOS functional activity of the adrenal glands and thyroid gland in the body of rats aged 3-5 months against the ground of EMR effect in the range of 895-905 MHz.

Materials and methods. The study was performed on 24 Wistar male rats with the body weight of 100-140 g. The animals were distributed into groups (6 in each) according to the series of the experiment due to the tasks of the study. The age of animals was chosen according to the table of age periodization of animal age to the human age [5] and corresponds: 3-month rats – human teen age (14-15years), 5-month rats – young people (19-21 years).

EMR effect on the body was simulated by means of the apparatus «EMIBIO-1.1» (Ukraine), certified by a certificate for a patent [6]. EMR range in the experiment was 895-905 MHz. The total period of radiation of animals was 2 hours a day.

The activity of catalase, SOD and Schiff base in the homogenate of the adrenal glands and thyroid gland was investigated by means of spectrophotometric method. The results of the study were statistically processed by means of Student t-criterion with variation statistics methods ("BIOSTAT" program). The probability of the obtained results was assessed on the level of significance no less than 95% ($p\leq0,05$).

Results and discussion. In the course of the experiment the AOS system activity was found to have a tendency to increase in experimental animals of both age groups against the ground of EMR action. It is evidenced by increased values of the indices of the quantitative content of antioxidant enzymes as compared to the control groups of animals. Thus, catalase content in the homogenate of the adrenal glands in 3-month rats was found to be 2,8 times up, in 5-month rats -1,2 times up. While examining the indices of the level of SOD and Schiff base in the homogenate of the adrenal glands increased quantitative content of both kinds of molecules in both experimental groups of animals was found. The increase is reliable p<0,01 (Table 1).

These signs can be a stimulating factor of the enzymatic systems of the adrenal cells occurring against the ground of an indirect pathogenic EMR effect on the cells. Chronization of over-exertion of the antioxidant system activation can be a cause of further failure of adaptation-adjacent reactions directed to preservation of homeostasis of the whole organism.

While comparing the indices of AOS activity of the adrenal glands against the ground of EMR

action between the two age groups it was found that catalase content in the homogenate of 3month rats was 1,2 times higher as compared to the 5th-month rats. SOD indices of the 3-month rats were 1,1 times up as compared to the5month rats, Schiff base – practically twice as much (Table 2).

According to literary evidence EMR has the biggest effect on the organism of children. The data obtained in the experiment demonstrate that EMR effect has similar influence on the organism of teenagers. AOS activity against the ground of EMR effect is found to have a tendency to increase in rats of a younger age. It can be explained by instability of the protective systems of the cellular membranes caused by the action of free radicals. The authors suggest that it is these disorders to cause a number of pathogenic mechanisms resulting in imbalance of LPO system and promote coordination disorders of general immune-metabolic processes.

Changes of AOS activity in homogenate of the thyroid gland was examined against the ground of EMR effect. The following was found: the content of catalase in 3-month and 5-month rats was reliably higher as compared to the control - 1,6 and 2,1 times up respectively; SOD indices in 3-month rats were 1,3 times, and in 5-month rats - 2,4 times up than those of the control indices. Schiff base content in homogenate of the thyroid gland was characterized by increase in both age groups of animals (Table 3).

Table 1

			groun		N enect				
3 months	Sc	hiff ba	se	Catalase				SOD	
	Ср.	±	Р	Cp.	±	Р	Ср.	±	Р
contr	1,49	0,06	0,074	0,50	0,021	0,26	29,48	0,01	0,012
ехр	1,67	0,05		0,514	0,011		32,53	0,38	
5 months	Sc	hiff ba	se		Catalase	e e e e e e e e e e e e e e e e e e e		SOD	
	Ср.	±	Р	Cp.	±	Р	Ср.	±	Р
contr	2,01	0,07	0,000	0,405	0,012	0,000	21,91	3,84	0,052
ехр	2,69	0,09		0,49	0,005		30,42	0,43	

Activity of the antioxidant system in the adrenal gland homogenate against the ground of EMR effect

Notes: (*)-p<0,05; (**)-p<0,01; (***) – p<0,001.

Table 2

Age correlation of antioxidant system enzymatic activity in the adrenal homogenate of rats against the ground of EMR effect

	So	chiff ba	se		Catalase			SOD	
	mean	±	Р	mean	±	Р	mean	±	Р
3-month	1,67	0,05	0,000	0,514	0,004	0,002	32,53	0,37	0,002
5-month	2,69	0,09		0,49	0,005		30,32	0,37	
	0.0= //	**1 0	04 (4444)		- 4				

Notes: (*)-*p*<0,05; (**)-*p*<0,01; (***) – *p*<0,001.

The results of the study are indicative of the formation and accumulation of oxidative forms in the tissues of the thyroid gland is more pronounced among 5-month rats as compared

to the animals of the younger group indicating the development of oxidative stress in the thyroid cells due to increased activation of AOS (Table 4).

Table 3

Antioxidant system activity in homogenate of the thyroid glanc	ł
against the ground of EMR effect	

			<u> </u>	0					
3-month		Schiff ba	ise		Catalas	е		SOD	
	mean	±	Р	mean	±	Р	mean	±	Р
contr	0,29	0,01	0,002	0,19	0,005	0,000***	10,22	0,48	0,004
exp	0,36	0,01		0,27	0,005		13,65	0,79	
5-month		Schiff ba	se		Catalas	e		SOD)
	mean	±	Р	mean	±	Р	mean	±	Р
contr	0,41	0,004	0,000***	0,18	0,004	0,000***	11,53	0,27	0,000***
exp	0,48	0,009		0,3	0,004		20,56	0,55	

Notes: (*)-*p*<0,05; (**)-*p*<0,01; (***) – *p*<0,001.

Table 4

Age correlation of the antioxidant system enzymatic activity in the thyroid homogenate against the ground of EMR effect

	Schiff base			Catalase			SOD		
	mean	±	Р	mean	±	Р	mean	±	Р
3-month	0,36	0,01	0,000	0,19	0,008	0,000	10,22	0,48	0,000
5-month	0,48	0,009		0,30	0,004		20,56	0,55	
N_{a+a+a} (*) $m < 0.05$ (**) $m < 0.01$ (***) $m < 0.001$									

Notes: (*)-*p*<0,05; (**)-*p*<0,01; (***) – *p*<0,001.

Conclusions. The data obtained are indicative of general negative effect of EMR on biological objects. Damaging mechanism of EMR effect on the endocrine glands is indirect in 3-month and 5month rats. Primary thermal effect provokes the development of the secondary membrane-toxic effect. Accumulation of AOS enzymes in the endocrine glands occurs as a result of damage of the membrane and internal cellular structures by free radicals [7], and it results in the failure of mechanisms of free radical oxidation and development of oxidative stress. Such disorders can stimulate chronic disadaptation of the compensatory-adjacent intracellular and intercellular ways of the cell protection. The authors suggest that biochemical investigation of AOS parameters, such as determination of catalase, SOD and Schiff base levels can be one of the prognostic indices to assess the degree of a harmful EMR action.

Prospects of further studies. The topicality of the issue and the necessity of more detailed approaches to its investigation are evidenced by a great difference of indices concerning EMR effect on the human organism, absence of clearly described, common scientific mechanisms describing the sense of a pathogenic action of

EMR on biological objects.

References:

1. Hideyuki Okano, Hiroyuki Ino, Yu Osawa, Toshiaki OsuganThe effects of moderate-intensity gradient static magnetic fields on nerve conduction. Bioelectromagnetics. 2012;33:518-26.

2. Karasek M, Woldanska-Okonska M. Electromagnetic fields and human endocrine system. Biol Eff of Electromag Radiat. 2004; 52(4):23-8.

3. Chesnokova NP, Ponukalina EV, Bizenkova MN. Obshhaja harakteristika istochnikov obrazovanija svobodnyh radikalov i antioksidantnyh system. Uspehi sovremen estestvoznanija. 2006;(7):37-41.

4. Rjazanceva LT. Fermenty-antioksidanty: strukturno-funkcional'nye svojstva i rol' v regulirovanii metabolicheskih processov. Vestn Voronezhskogo gos tehn un-ta. 2011; 7(2):26-9.

5. Povroznjuk VV, Gopkalova IV, Grigoreva NV. Integral'na ocinka reproduktivnoï funkciï samciv laboratornih grizuniv: metod. rekom. Probl starenija i dolgoletiya. 2011; 20(4):393-7.

6. Nikolayeva OV, Shutova NA, Sulhdost IA, inventor; Pristrij dlja elektromagnitnogo oprominjuvannja dribnih laboratornih tvarin. № 110205. Ukraine. 2016 sep 26. DDC-UDC 618.344-053.13-071-073.4/.7

DOI:10.19221/2017419

Yasnikovska S.M.,

Hrytsak H.

Department of Obstetrics, Gynecology and Perinatology, Higher State Educational Establishment of Ukraine "Bukowina State Medical University", Chernivtsi, Ukraine, jasnikovska.svitlana@bsmu.edu.ua

EVALUATION OF CLINIC-LABORATORY AND ULTRASONIC RESEARCH RESULTS IN DIFFERENT FORMS OF THE CHORION'S PATHOLOGY IN THE FIRST THREE-MONTH OF GESTATION

Abstract. The article presents the results of a retrospective analysis of clinical-laboratory and anamnestic data of 40 pregnant women with chorionic pathology of the chorion development in the form of subchorionic (30) and subamniotic (10) hematomas. It has been established that subchorionic hematomas usually develop on the background of thrombophilic states and immunological disorders, they have smaller size, can be formed or resolved faster, they are combined with hypoplasia of chorion and disorders of hemodynamics in the uterus, what further contributes to the formation of placental dysfunction. Subamnitic hematomas occur more often on the background of chronic bacterial and virus infection which occur 3-6 weeks later than subchorionic, they are larger in size and they can be under reversible development during long period of time and are not accompanied by a violation of hemodynamics in myometrium. The most common complication of chorion (placenta) in the trimester (the first three months) is the development of placenta dysfunction, which requires dynamic monitoring and preventive measures throughout the hematological period.

Key words: miscarriage, subamniotic and subchorionic hematomas, ultrasound examination, dopplerometry, placental dysfunction.

Introduction. The problem of miscarriage is very popular in modern obstetrics, as 20% of clinically diagnosed pregnancies end with spontaneous interruption of pregnancy and 75-80% of cases are done in the first three mounths. The maternal factor, as a reason of not giving life at the early stages of gestation, is represented by hypoplasia of the endometrium, hemodynamic disorders in the vascular flow of the uterus. Often, these changes are accompanied by infectious conditions, endocrinopathies and hemostasis disorders [1, 3].

Most of all unsuccessful endings of pregnancy in the short term are coused by placental defects, which are characterized by elegant and fragmentated trophoblast, by decrease in invasive properties of the cytotrophoblast [2]. Also it is coused by the formation of hematoma. According to many examinations, the frequency of hematoma formation among pregnant women was 3.7%, and during usual miscarriage some partial separation of chorion occurred in 10-15% of patients [4, 7]. Subcortical hematomas are found more frequently, they can be diagnosed during the 7th-8th week of gestation and can be mostly resolved by the end of the 1st trimester of gestation [5]. Subamniotic hematomas are less common, but if they appear, the probability of death of the embryo is much higher [4]. According to some authors the pathogenetic mechanisms of the appearance of subhorial hematomas are the activation of intravascular coagulation of blood, the presence of antiphospholipid antibodies, and the increased content of proinflammatory cytokines [6].

For the diagnosis of chorionic pathology, ultrasound method is used.

The aim of the research: to evaluate the different variants of chorionic and placental pathologies in the first trimester of pregnancy using clinical-laboratory and ultrasound examination methods.

Material and methods. A retrospective analysis of clinical and anamnestic data in 40 pregnant women with pathology of development of chorion in the form of subchorionic (30) and

subamniotic (10) hematomas has been performed.

The average age of pregnant women was 31.7 \pm 0.9 years, the anamnesis of which was built of 1-4 pregnancies, and the usual miscarriage was observed in 30% of observations during the 7th-8th week. There were 19 women which had a delivery (childbirth) in their anamnesis of giving birth, and 4 women of those 19 had a perinatal losses.

The somatic anamnesis of women was burdened with chronic tonsillitis (47.5%), urinary tract (30.0%) and cardiovascular (17.5%) system diseases, gastrointestinal tract diseases (20.0%).

Besides the evaluation of clinical and anamnestic data, а dynamic ultrasound examination was performed with dopplerometry of the blood flow in the uterine arteries, myometrium in the zones of separation and in intact zones. Indicators of blood flow in arcuate (Aa), radial (Ra), basal (Ba) arteries were examined. The size of the embryo (fetus), the location and features of the chorionic structure (placenta) were also examined using ultrasound observation. Hematoma's character (subchorionic, subamniotic, marginal) size dimensions, stages of development were determined during its estimation.

Bacteriological and virological methods (bacteriological hanging from the cervical canal, PCR diagnostics of urogenital infections). hormonal (evaluation of the nature and severity hyperandrogenism) of and hemostasis examinations, determination of the level of antiphospholipid antibodies also were used.

Results of the research and their discussion. A high frequency of mixed bacterial and viral infection (32.5%) was found in the examined women, what can indicate that they have chronic endometritis. Hyperandrogenism of different genesis was registered in 50.0% of cases, antiphospholipid antibodies were found in 62.5% of the examined women. Chronic DIC syndrom with partial chorion separation occurred in each the second pregnant woman during the hypercoagulation stage.

It has been established that subchorionic hematomas are more common than subamniotic hematomas. They can be diagnosed during the $8,3^{th} \pm 0.4$ weeks of gestation, with an average size of $1,32 \pm 0,25$ cm³. Their size decreased to $1,15 \pm$ 0.34 cm³ using dynamic ultrasound observation, there was no image of hematoma in 6 (20%) cases, and the formation of hematomas was in 7 (23,3%) cases. The transformation of subchorionic to subamniotic hematoma happened in 5 (16,7%) women. Hypoplasia of chorion was found in the examined women with subchorionic hematomas 4,5 times more often than in the examined women with the subamniotic hematomas. During dopplerometry in women of this group there was a lack of visualization of blood flow in radial and basal arteries and increase of resistance (0,76 ± 0,05 at the norm of 0,60 \pm 0,02) at the level of arcuate arteries, which can be considered as a compensatory reaction that prevented progression of chorion separation. Increased vascular resistance at the uterine artery level was an adverse factor in the further formation of placenta dysfunction.

Subamniotic hematomas were more often diagnosed during $12,1^{th} \pm 0,5$ week of gestation and their size was $17,7 \pm 6.0 \text{ cm}^3$, which showed the tendency of decreasing to $11,1 \pm 3.5$ cm³ using a dynamic observation. At the same time there was no complete resorption of such hematomas, and only 3 cases were registered at the stage of the formation. Women of this group had the bacterial-viral infection (genital mycoplasma, ureaplasma, chlamydia, epidermal staphylococcus and streptococcus of group B, herpes) 7,5 times more frequently than patients which had subchorial hematomas. The blood flow in myometrium was not broken in zones of separation during the dopplerometry.

The further course of pregnancy in women with different forms of chorion separation was complicated with the threat of interruption during the first trimester in all examined persons, during the second trimester – in each second pregnant woman, during the third trimester – in 25% of cases. Signs of placental dysfunction occurred in 17.5% of examined pregnant women during the second trimester and in 52.5% – during the third trimester in the period of gestation.

2 out of 30 examined women had premature labors in the case of subchorionic hematomas which had been detected during the first trimester of pregnancy, and 5 out of 10 examined women had premature labors in the case of presence of subamniotic hematomas, which confirmed the initiating role of infection in the formation of subamniotic hematomas.

Conclusions. As subchorionic а rule, hematomas develop on the background of thrombophilic states and immunological disorders, have smaller size, can be organized or resolved quicklier, and can be combined with hypoplasia of chorion and hemodynamic disorders in the uterus, what further contributes to the formation of placental dysfunction.

Subamniotic hematomas often occur on the background of chronic bacterial and viral infection, they occur during the 3-6th weeks later than subchorionic, they are larger in size and are not accompanied by a violation of hemodynamics in myometrium.

The most frequent complication of the chorion (placenta) separation is the development of placenta dysfunction during the first trimester, which requires dynamic monitoring and preventive measures during the gestation period.

Perspectives for further research. Deep

examination of the problem of miscarriage in women with chorion separation during the 1st trimester of gestation and its differentiated correction will have practical importance in the development of complex treatment meathods and the prevention of perinatal complications.

References:

1. Kirjushhenkov PA, Belousov DM. Probl beremennosti. 2007; 13(5):19-25.

2. Radzinskogo VE, Orazmuradova AA, editors. Rannie sroki beremennosti. M: 2005. p. 269-85.

3. Sidel'nikova VM, Kirjushhenkov PA. Gemostaz i beremennost'. M: 2004. 179-87.

4. Strizhakov AN, Ignatko IV. Poterja beremennosti. M: 2007. 145-6.

5. Ozkaya U, Ozkan S, Ozeren S, Corakci A. J Clin Ultrasound. 2007; 35(7):382-6.

6. Pelinescu-Onciul D. Gynecol Endocrinol. 2007; 23(1):77-81.

7. Tamura H, Miwa I, Taniguchi K. Hum Reprod. 2008; 23(2):285-9.

DDC-UDC 616.329+611.018.82+616.8

DOI:10.19221/2017420

Yashchyshyn Z.M., Zaiats L.M., Yurkiv I.Y., Maslyak K.T., Vodoslavska N.Y., Sikomas M.T.

Department of Pathological Physiology Ivano-Frankivsk National Medical University, Ivano-Frankivsk, Ukraine patfisiology@ifnmu.edu.ua

CHANGES IN NEUROGLIAL INTERRELATION OF MUSCLE-INTESTINAL NERVE PLEXUS OF ESOPHAGUS AFTER ONE-SIDED CROSSING OF VAGOSYMPATHETIC TRUNK

Abstract. Experimental examination was performed on 43 adult cat. Neurono-glial complex was studded using Bilshovsky-Gross silver impregnation method and morphometry in normal cases and in animals with unilateral vagotomy. Reactive-degenerative processes were shown before 30 days. Regeneration-hypertrophic processes was found out in later term. Them morphometric value was non-nonnal. Conclusion: during thoracal, esophageal and gastric surgery is very important to preserve branches of nervus vagus which innervate esophagus.

Key words: esophagus, musculo-intestinal nervous interlacement, vagotomy, neuron, glia.

Introduction. In medical practice, you often have to deal with various diseases of the esophagus. Pathological changes in the esophagus can be found in 37, 5 – 93, 0% of cases during the examination of the sectional material for different somatic diseases which was taken from the body of dead patients, and in 12, 7 – 68, 7% of cases during endoscopic examination of the digestive tract in patients which were cured for various diseases or damage of the esophagus [2, 3, 4]. n addition, the frequency of various diseases of the esophagus is constantly increasing [1]. That's why morphological examination of the esophagus during the above-mentioned pathological states have a significant applied value.

It is known that the esophagus belongs to those organs which are under the significant influence of the nervus vagus. Mechanical compression of this nerve, its traumatism during surgery or some inflammation can be observed during many diseases of the chest and this can be the cause of changes in the esophagus [9, 12].

Exemening the nervous elements of the organs of the digestive system, the researchers have found that most neurons of the esophagus are concentrated in its muscular-intestinal nerve plexus [10]. The variability of the structure of the ganglion data is observed in different parts of the body (cranial, middle, caudal), and in each individual [5].

Neurology which provides the processes of metabolism in the nerve cells is in the close connection with neurons in the nervous system. This relates also to intramural plexus of the digestive tract [11]. But too little attention of the studying of this important structural formation in the autonomic nervous system, and especially the neuron-glial complex of the esophagus is given.

The aim of the research. Determination of the nature of changes in the structure of the neuronal-glial complex of the muscular-intestinal nerve plexus of the esophagus after the defection of its parasympathetic innervation.

Materials methods. and Experimental examination was performed on 43 adult cat (Felis domestica) almost of the same age and weight. 20 animals were in the group of control, and 23 were in the group of examination. The ganglia of the muscular-intestinal nerve plexus of the esophagus and their nerve elements were found with impregnation of nitrous oxide silver using the method of Bilshovsky-Gross. Morphometric, variational and correlation analyzes were performed.

We chose the intersection of only the right (one side) vagotomy trunk since bilateral intersection (trunci vagales) in this experiment on cats leads to dysfunction of cardiopulmonary complex, which incompatible with life of animals.

All operations were carried out under the anesthesia using the rules of asepsis and antiseptics. Animals were put to death with overdosing of ether anesthesia. The terms of the experoments: 1, 3, 7, 15, 30, 60, 90 days after surgery.

Results of the research and their discussion. During the first and the third day after the vagotomy the neurons of the muscular-intestinal nerve plexus of the esophagus showed various tenctorial properties, which were manifested by their various coloring. Moreover, the histology of the neurons in the distal part of the esophagus, indicated their acute edema, chromatolysis and cariolysis. Ganglia area (for one neurocyte) of muscular-intestinal nerve plexus increased in the cranial and medial parts of esophagus during these periods. This indicated decreasion the number of neurons in the area of the ganglia. Anything did not change in the caudal part of the organ.

The number of glial cells did not significantly change around each of the neurocytes in period of experiment .

We observed in all sections of the esophagus a significant number of neurons 7-15 days after vagotomy histological changes of which show the deployment of the degenerative process. Morphometric examinations confirm the degenerative process. Thus, the "living space" of the neurocyte increases in comparison with the norm in the cranial part of esophagus in 2, 48 (P <0.001), in the medial – 1,37 (P <0.05) and caudal – 1,75 times (P < 0.01).

Significant proliferation of neurology can be observed during this term of examination. The number of glial cells which are connected with one neurocyte significantly increases in all sections of the esophagus, and the area of the surface of the neurons, for one gliocyte, decreases.

The degeneration of the structural components of the ganglia of the muscularintestinal nerve plexus can be detected in all sections of the esophagus after 30 days of the experiment. Neurons are observed at different stages of degeneration, but in most cases – at the last stage. During this period, the area of ganglion for 1 neurocyte increases in comparison with the norm: in the cranial esophagus in 3,16 (P < 0.001), in the medial – 2,11 (P < 0.01) and caudal – 1,71 times (P < 0.01).

The proliferative reaction of neurology is intensified. The number of glial cells around each of the neurocytes is statistically significantly increased in comparison with the norm in all sections of the esophagus.

Degenerative processes in the ganglia of the muscular-intestinal nerve plexus fade out after 60-90 days after vagotomy, but regenerativehypertrophic (compensatory) reactions develop. There is a hypertrophy of the apophysis and coltablers in neurons. The number of it increases. Often large neurons with the wrong form of the body, sharply thickened initial parts of the dendrites and the axon can be found.

Morphometric examinations show that during this period, the "living space" of neurocyte decreases in the comparison with the previous period, but this indicator does not reach its normal size. The proliferative reaction of neurology fades down. The area of the neuron, for one gliocyte, is slightly different from norm.

It is known that the intersection of the nervus vagus causes transneuronal degeneration in all intramural ganglias of the gastrointestinal tract, especially the muscular-intestinal nerve plexus [6, 8, 13]. This is confirmed by an analysis of the data we have received. The "living space" of the neurocyte, the area of the nerve ganglion, for one neurocyte, is statistically significantly increasing in all sections of the esophagus to 30th day, what shows some increase in the degeneration of neurons.

During 60-90 days of experiment some slight decrease in the "living space" of neurocyte in all sections of the esophagus can be observed if compare it with the previous term (30 days). However, these changes are not statistically reliable. As a contrast, in comparison with the norm, this indicator in all sections of the esophagus remains statistically significantly higher on the 60th and 90th day of the examination. This fact shows that the neurons of the muscular-intestinal plexus of the esophagus, degenerating as a result of vagotomy, they are not subjected to

cellular regeneration by the way of amyotonic or mitotic division and are not quantitatively renewed. However, reparative recovery occurs in the result of intraneuronal (intracellular) hyperplasia, which is the structural basis for restoring the functional capacity of nerve structures. This was stated by the rechearches of neuromorphology [8] and summarized by D.S. Sarkisov in 1977 [7], describing the general principles of regeneration of the nervous tissue.

Conclusion. 1. Reactive reaction of the neurons of the muscular-intestinal nerve plexus can be observed after right-sided vagotomy during the early stages of the experiment (1 - 3 days). It is more visible in the distal esophagus, in which degenerative phenomena are observed also. 2. Next, during 7-30th days in the ganglia of the muscular-intestinal nerve plexus throughout the organ, a significant part of the neurons is necrotized, what shows a profound degenerative changes process. Such are particularly pronounced in the proximal and middle sections of the esophagus. They are accompanied by proliferation of glial cells. 3. During the late stages of the experiment (60-90th days), on the background of degenerative phenomena, an active regenerative-hypertrophic process unfolds, which is manifested not by the increase in the number of neurons in the ganglia of the muscularintestinal nerve plexus, but by the reparative recovery of neurocytes by intraneuronal (intracellular) hyperplasia. 4. Paying attention to the significant changes in the structural organization of the muscular-intestinal nerve plexus of the esophagus, even with oneway intersection of the nervus vagus, in surgical practice during the medical surgery on the organs of the chest, cardial part of the esophagus and stomach it is necessary to save maximally the branches of the nervus vagus, which usually go to the esophagus.

Prospects for further research. Cats have marked connections between the sympathetic trunk and the nervus vagus in the form of anastomosis and the combining of nodes of the sympathetic trunk with cranially located components of the nervus vagus. Such a

parasympathetic trunk was crossed. Taking into account that not only parasympathetic, but also sympathetic nerve fibers were crossed, in further researches it would be necessary to examine changes in the sympathetic innervation of the esophageal after oneway vagotomy.

References:

1.Volobuev NN. Izbrannye glavy klinicheskoj jezofagologii. Simferopol: 1996. 36 p.

2. Kit OM, Bob AO, Vardinec' IS, Koval'chuk OL. Stan sekretornoï ta motorno-evakuatornoï funkciï shlunka u hvorih na virazkovu hvorobu dvanadcjatipaloï kishki i vibir metodu likuvannja. Shpital'na hirurgija. 1998;(1):42-6.

3. Koval'chuk LJa, Suhins'kij KI, Suhins'kij RK. Strukturna organizacija intraorgannogo krovonosnogo rusla stinok shlunka ljudini. Shpital'na hirurgija. 1998;(4):55-9.

4. Koval'chuk LJa, Maksimljuk VI, Smachilo II. Morfofunkcional'ni zmini pechinki pri obturacijnij zhovtjanici z klinichnimi oznakami holangitu. Shpital'na hirurgija. 2000; (1):40-2.

5. Kolesnikov LL. Anatomo-topograficheskie issledovanija sfinktera pishhevodno-zheludochnogo perehoda u cheloveka. Arh anat, gistol, jembriol. 1990; 98(3):76-84.

6. Lavrent'ev BI. Innervacija pishhevaritel'nogo trakta. I sessija po vopr. fiziol., klin., i morfol. pishhevaritel'noj sistemy posvjashh. pamjati I.P. Pavlova. Har'kov: 1998. 20-3.

7. Sarkisov DS. Ocherki po strukturnym osnovam gomeostaza. M: Medicina; 1977. 351 p.

8. Jarygin NE, Jarygin VN. Patologicheskie i prisposobitel'nye izmenenija nejrona. M: Medicina; 1973. 191 p.

9. Berthoud HR, Patterson LM, Willing AE. Capsaicin-resistant vagal afferent fibers in the rat gastrointestinal tract: anatomical identification and functional integrity. Brain Res. 1997; 746(1-2):195-206.

10. Christensen J, Fang S. Colocalization of NADPH-diaphorase activity and certain neuropeptides in the esophagus of opossum (Didelphis virginiana). Cell & Tissue Res. 1994; 278(3):557-62. DDC-UDC 611.314+611.716.1/.4]-013-053

DOI:10.19221/2017421

Navarchuk N.M.,

M.G. Turkevych Department of Human Anatomy, Higher State Educational Establishment of Ukraine "Bukowina State Medical University", Chernivtsi, Ukraine

Kosteniuk S.V.

Department of Surgical and Pediatric Dentristry Higher State Educational Establishment of Ukraine "Bukowina State Medical University", Chernivtsi, Ukraine

MORPHOGENESIS OF THE DENTOGNATHIC APPARATUS DURING THE EARLY TIMES OF THE HUMAN ONTOGENESIS

Abstract. The maxillary and mandibular processes, as well as vestibular and dental laminas appearance, have been forming during the embryonic period of the human ontogenesis. Differentiation of the mandibular processes with Meckel's cartilage development is under the way. In the pre-fetuses, the considerable changes undergo in the mandibular, and developmental processes of the oral cavity structures are in their continuous growth. The study of the dentognathic apparatus maintenance regards to be of important practical significance; as far as in this area frequently encounters structure variants and developmental anomalies required surgical correction.

Key words: a jaw, dental lamina, vestibular lamina, the oral cavity.

Introduction. The actual problem of the present-day morphology deals with searching of special structures in the digestive apparatus and providing them with an adequate functioning [3]. The dentists are used to be interested in the state of the oral cavity: such as palatal tonsils, teeth, mucous membrane, the tongue state at different diseases, thus they consider the oral cavity to be "a small window". Looking at this small window, you may suppose to detect the disease which is present in a certain organ or a system, and predict its clinical course [6]. The study of the dentognathic apparatus maintenance regards to be of important practical significance; as far as in this area frequently encounters structure variants and developmental anomalies required surgical correction [1, 2].

The specimen of 21 embryos and 23 pre-fetus were selected to be the materials of the research. The following methods of investigation have been used: macroscopy, microscopy of the series of gradual histological sections, an ordinary and fine dissection.

Germs of the maxillary and mandibular processes in embryos of 5,0-5,5mm in TCD are introduced by an accumulation of homogeneous cell mass of the mesenchyme. In embryos of 6,8-7,9 mm in TCD the process of gnathic processes differentiation starts, especially of their caudal segments. In embryos of 8,0-8,5 mm in TCD the maxillary processes move to lateral ones, but on this particular stage of development, there is no joining between them. They are separated only by small fissure directed to the eye germ. In embryos of 11,0-12,5 mm in TCD the maxillary processes continue their growth. Their fusion with lateral nasal processes arises. The first signs of the beginning of the teeth development are observed at the 6th week when the length of the embryonic body is 11 mm. Multilayers epithelium, lining longwise the oral cavity of the future upper and lower jaws, make a thickening resulted from an active reproduction of their cells and changes in the plane of cell division. This thickening (a primarily epithelial band) divides into two laminas - alveolar and dental ones. In the alveolar regions of the oral cavity, these epithelial laminas initially insert in the mesenchyme separately one from another. The vestibular lamina is characterized by rapid proliferation of cells and their а submergence into the mesenchyme with the following degeneration in the central regions, and resulting in the beginning of the buccolabial furrow formation. The dental lamina takes the arch shape or horseshoe shape and is located in the adjacent to the mesenchyme in almost a vertical position with some inclination backward. In embryos of 12,0-14,0 mm in TCD the mandibular processes are completely merged with each other by their front endings. This

process assists the mandibular arch formation. It results in the differentiation of the mandibular processes with gradual Meckel's cartilage formation.

In the pre-fetuses of 16,5-17,5 mm in TCD the development of the lower jaw starts. The germ formation and growth appear in the caudal segments with a formation of 3-4 thickenings, which have globular or prolate spheroid form. The primordium of the jaw has the appearance of the plate with vertically prolate form. It is located outer of the Meckel's cartilage. The oral cavity is covered with two layers of epithelium and has the shape of the fissure. It is bounded by maxillary and mandibular processes. In the pre-fetuses of 27,0-29,0 mm in TCD the germ of the maxilla appears. The size of the mandibular arch increases rapidly. The germs of the both jaws join together and form the framework of the future jaw. At transversal sections, the mandible transforms into the horseshoe shape lamina, to the middle of which the Meckel's cartilage located. Outer and inner laminas are the germ of the alveolar processes. On the sagittate sections, the mandible replicates the line of the Meckel's cartilage. The angle of the mandible at this particular stage of its development in not determined yet. In the caudal segments, the thickening appears, which presents the lamina oriented in the sagittate plane - the germ of the coronal processus. From behind, the thickening has the spheroid form and becomes the germ of the articular processes. In this particular stage, the dental plate manifests itself alongside the arch. The formation of the caliciform accumulation, on the thin stalk, appears on the back surface of the plate, which are the germs of the enamel organs of the deciduous teeth. In the pre-fetuses of 34,0-42,0 mm alveolar plates widely diverge approaching to the surface of the mandibular arch from the top, enclosing the germs of the teeth, and reaching the epithelial lining of the mandibular arch. At this particular stage, the place of the mandibular angle location may be defined, revealing its body and a ramus. The vertical size of the mandible considerable predominates to the transversal one. At the same time on its free ending, in the middle segments, the prominences appear, formed as a result of muscles fixation such as mandibulolingualis and digastic muscles. The body of the mandible is inclined approaching to the Meckel's cartilage. The enamel body firstly acquires the cap shape enclosing the compact accumulation of the mesenchyme cells – dental papilla.

The mesenchyme surrounding the enamel organ condenses making the dental sac. The dental plate keeps the connection with enamel organ with the assistance of the epithelial band – cervix of the enamel organ. This band gradually becomes thin, and to the end of the 3 month resolve, as far as the mesenchyme germinates via it.

Due to the result of this process, the enamel organ completely separates from the epithelial lining of the oral cavity. Soon the enamel organ becomes bigger in size and extends acquiring the bell shape, and the dental papilla filled inside becomes longer. At this stage the destruction of the dental plate into isolated epithelial cells appears. Intact areas of the dental plate are preserved only in the segments where the formation of the enamel organ of the permanent teeth arises - at its lower edge and in the back segments. The epithelial cells remained as a result of disintegration of the dental plate become the part of the Malassez islets [4]. In pre-fetuses of 42,0-56,0 mm in TCD the oral cavity is completely constructed. The vestibule and the oral cavity are represented. It is covered with a plane epithelium which is located on basal membrane. In the place of the dental plates appearance, the number of the epithelial layers becomes considerably larger in comparison with other segments of the oral cavity. The germs of the upper and lower teeth are already defined. The enamel organ, the dental papilla, and the dental sac form the dental germ [5].

Ascertainment of the precise and complete facts concerning regularity of the chronological the topographic-anatomical succession of relationships of the gnathic structures with others, and with adjacent formations in the prenatal period of the human development, as well as time establishment and morphological premises of the probable variant development of their structure and congenital anomalies appear to be the most important direction of morphology [7]. The received results may be used in the pediatric dentistry, facio-gnathic surgery as the standard for normal and abnormal defects.

References:

1. Garmash OV. Nazarjan RS, Gargin VV. Mikrocirkuljatornye narushenija tkanej parodonta pri zaderzhke vnutriutrobnogo razvitija Ukraïns'kij medichnij al'manah. 2012; 13(3):66-8.

2. Gvozdeva JuV, Zaharov IA. Kompleksnyj metod profilaktiki i lechenija stomatologicheskih zabolevanij u detej s vysokoj stepen'ju perinatal'nogo riska. Aktual'nye problemy upravlenija zdorov'em naselenija: Sb nauch trudov -Nizhnij Novgorod. 2009: 86-9.

3. Korzhevskij DJe, Giljarov AB. Osnovy gistologicheskoj tehniki. SPb: SpecLit; 2010. p. 6-7.

4. Lucik OD, Chajkovs'kij JuB. Gistologichna

terminologija. Mizhnarodna terminologija z citologii ta gistologii ljudini. Kiiv: Medicina; 2010. 304 p.

5. Jamshhikov NV, Kudrova VA, Tlustenko VP. Gistologija zubocheljustnogo apparata i drugih organov polosti rta. Samara: Sodruzhestvo pljus; 2004. 176 p.

6. Prubhu SR, editor. Textbook of oral and axillofacial anatomy, histology and embryology. Oxford: University Press; 2006. 286 p.

7. Saraiva MC, Bettiol P, Barbieri MA. Are intrauterine growth restriction and preterm birth associated with dental caries? Community Dent Oral Epidemiol. 2007; 33(3):364-76 DDC-UDC 611.321.013.018-053.13

Rusnak V.F.,

M.G. Turkevych Department of Human Anatomy, Higher State Educational Establishment of Ukraine "Bukowina State Medical University", Chernivtsi, Ukraine

Bedyk V.V.

Department of Surgical and Pediatric Dentristry Higher State Educational Establishment of Ukraine "Bukowina State Medical University", Chernivtsi, Ukraine

FEATURES OF PHARYNGEAL MORPHOGENESIS IN FIVE-WEEK EMBRYOS

Abstract. The article highlights the features of morphogenesis and the development of the pharyngeal topography and clarifies the topographic-anatomical relationship between the pharynx and surrounding structures in the ontogeny of the human five-week embryos. The anlage of the pharynx occurs in the embryos of the fifth week of ontogenesis, representing an enlarged and flattened cranial part of the gut in the dorsoventral direction. In this period, there is no complete formation of all parts of the pharynx due to the absence of the secondary palate and due to the unclear separation of the pharynx from the larynx and from adjacent structures.

Key words: pharynx, anlage, development, topography, human.

Introduction. In the structure of the incidence of diseases in children and adolescents the pathology of the respiratory system is among the most common ones [1]. It should be noted that in the group of children from birth to 14 years of age, the rate of respiratory diseases, which includes the pathology of the pharynx and lymphoid tissue associated with its mucous membrane, is higher compared with the group of children aged 15-17 years. The high frequency of registration of diseases of respiratory organs, cases of chronic pathology requires the expansion of groups of dispensary supervision of children [2, 3].

The pharynx is a unique organ that is under maximum antigenic stress and fullfils an immunoreceptor function, which is to familiarize with antigens of the lymphoid tissue associated with the mucous membrane and to populate other organs with antigen-primed lymphocytes. Lymphoid tissue, associated with mucous membranes of the tubular organs, and its reactivity have been studied quite fully [4, 5]. The data on the morphogenesis of the respiratory tracts are quite complete, while the issue of the formation of the lymphoid tissue of the pharynx associated with the mucous membranes in the early postnatal period remains poorly understood [6, 7, 8].

Objective. of То study the features morphogenesis and the development of the pharyngeal topography, clarify the to topographic-anatomical relationship of the pharynx with the surrounding structures in human embryos.

Material and methods. A histological study of

human embryos was carried out on the corpus material of the embryos, whose death was not associated with ENT pathology in accordance with the Helsinki Declaration of the World Medical Association "Ethical principles of medical research involving the human being as a research object" (1964-2000). The examination of the pharynx was carried out in the Chernivtsi Regional Forensic Medical Bureau and at the M.H. Turkevych Department of Human Anatomy of BSMU. After fixation in a 10% solution of formalin, the histological material was coated with paraffin according to the generally accepted scheme. For the morphological study, paraffin blocks of human embryos were used. To obtain the sections we used a sanitary microtome, which allowed serial sections and conducting preparing histological studies. Paraffin sections which were 4-6 microns thick were stained with hematoxylin and eosin according to the standard method and method of Van Gison and subjected to a thorough microscopic examination. Morphometric measurements were performed in typical histostructural sections of human embryos. Mathematical processing of data was carried out at the M.H. Turkevych Department of Human Anatomy of BSMU using methods commonly accepted in morphology.

Results and discussion. During the fifth week of the embryonic period of ontogenesis (embryos with 6.0 - 8.0 mm of crown-rump length CRL), the pharyngeal anlage is an enlarged front part of the large intestine which is 133 - 136 microns long. The pharynx in this period of intrauterine
development is represented by a wide low tube, heavily flattened in the dorsoventral direction.

The oral groove, which is the initial part of the pharynx, is limited superiorly by an unpaired frontal process, inferiorly with a cardiac protuberance and with the maxillary processes on both sides. Its posterior border is formed by the maxillary arch. The oral groove contains a small unpaired mesodermal tubercle, covered with a multilayered flat keratinized epithelium, which is a rrudiment of the tongue.

The ectoderm cells, compactly located downwards and on both sides of the frontal process, form two thickened plates, represented by a 4-5-row cylindrical epithelium. At the initial stage of the anlage of the nasal placodes, on whose free surface there are depressions - the formation of nasal fossas. Morel laterally of the frontal process there are eminences, which in the future become the nasal processes. The nasal fossas are located between them, caudadly to which the maxillary processes are formed and they grow towards the median line.

In the upper pharyngeal region on the right and left lateral walls there are openings with the diameter of 1.24 - 2.08 microns, which are funnel-shaped - the pharyngeal openings of the auditory tubes.

The caudal border of the pharynx in embryos passes through the fore intestine in a place that corresponds to the level of the mesenchyma cells congestion- the future anlage of the cricoid cartilage of the larynx, that is, at the very initial stage of embryogenesis, it is considered to be the common boundary of the organ.

More dorsally of the pharynx anlage, in the area that corresponds to the future base of the skull, a congestion of the mesenchyma begins to show. The anlage of the tongue is located more ventrally of the pharynx anlage.

The pharyngeal wall throughout is represented by a two-layer epithelium, which consists of basal high prismatic cells and covering small cubic cells. The epithelium is located on the basal membrane, outside of which lies a solid layer of undifferentiated mesenchyma which is 104 - 162 microns thick. The height of the epithelium is almost the same throughout the organ and reaches 6-10 microns. The nuclei of its cells are usually oval, of 3-4 microns in size, and are located at different levels: most of them are located in the middle part of the cells, some of the nuclei are localized closer to the base, and some occupy an apical position. The lumen of the pharyngeal anlage (on transverse sections) in the cranial part is 486-510 microns, and in the caudal one it is narrowed to 178-182 microns. The nuclei of cells of the mesenchymal layer, which surrounds the pharynx rudiment, as well as the nuclei of the cylindrical epithelium lining its lumen, are located at different levels. It should be emphasized that the intensity of their color is practically the same.

Conclusion. The anlage of the pharynx takes place in the embryos of the fifth week of ontogenesis, representing an enlarged and dorsoventrally flattened cranial part of the gut. In this period, there is no complete formation of all parts of the pharynx due to the absence of secondary palate and due to the unclear separation of the pharynx from the larynx and from adjacent structures.

Prospects of further research. In the future it is planned to study the development and formation of the pharynx in other age periods of human ontogenesis.

References:

1. Moisyenko RO. Chastota i struktura zahvorjuvanosti ditej v Ukraïni ta shljahi ïi znizhennja. Perinatologija i pediatrija. 2009; 4(40):23-6.

2. Volosovec AP. Pul'monologija detskogo vozrasta. Kiev: Zdorov'e; 2004. 608 p.

3. Julish El, Jaroshenko SJa. Chastaja respiratornaja zabolevaemost' detej rannego vozrasta i persistirujushhie infekcii. Sovr pediatrija. 2010; 31(3):44-9.

4. Potoc'ka OI. Morfofunkcional'na harakteristika limfoïdnih utvoren' gortani ljudini v ontogenezi ta ïh reaktivni zmini [avtoreferat]. Ternopil': 2009. 20 p.

5. Svitlic'kij AO. Osoblivosti budovi klubovoï i slipoï kishok novonarodzhenih pislja vnutrishn'oplidnoï diï antigeniv [avtoreferat]. Simferopol': 2008. 18 p.

6. Makar BG, Popeljuk O-MV, Jakovec KI. Suchasni pogljadi na morfogenez i topografoanatomichni vzacmovidnoshennja gortani v rann'omu ontogenezi ljudini: (ogljad lit). Bukovins'kij med visnik. 2009; 13(2):100-3.

7. Syrcov VK, Alieva EG, Potockaja EI. Osobennosti formirovanija immunomorfologicheskogo kompleksa organov dyhanija i prostaty pri antigenom razdrazhenii. Svit medicini ta biologii. 2005; (3):64-6.

8. Hmara TV, Ahtemijchuk JuT, Gulik RP. Eponimichni nazvi struktur u klinichnij anatomii golovi ta shii. Klin anat ta oper hirurgija. 2010; 9(1):117-22. DDC-UDC 616-097. 1: 616-053.13] : 611.41.018.1] - 092.9

DOI:10.19221/2017423

Talanova O.S, Apt O.A.

The department of human anatomy, operative surgery and Topographic anatomy, Zaporozhye State Medical University, Zaporizhzhya, Ukraine, talanova_2003@mail.ru

SPECIFICS OF DISTRIBUTION OF GLYCOSAMINOGLYCANS IN THE WHITE PULP OF THE SPLEEN AND STROMA OF RATS AFTER EXPERIMENTAL MODELING INJECTION INSIDE THE FETUS OF ANTIGENS OF DIFFERENT NATURE

Abstract. This work describes peculiarities of rat's splenic white pulp and stromal elements structure attached to different terms after the birth normally and after intrauterine injection of antigens of different kinds. It's established that intrauterine injection of antigens with different nature leads to quantitative changes in the accumulation of glycosaminoglycans low sulphated to 11 days of life, and high sulphated compounds on the first month of life, regardless of the antigen type, that may be a manifestation of qualitative imbalance in the formation of connective tissue in different functional zones of the rat's spleen. The majority of these changes disappear up to 90th day after the birth. **Key words:** spleen, white pulp, stroma, connective tissue, morphogenesis, intrauterine antigens injection, glycoproteins

Introduction. Recently observed a progressive increase in the number of infectious and allergic diseases in infants, which makes it necessary to study the role of the immune system in these processes and develop new parenteral and oral vaccines because children's health is one of the most important indicators of the country's wellbeing and health in general. There is a high frequency of pathological course of pregnancy, infection of pregnant by various antigens [6], accompanied by a dysfunction of the placenta and inside the fetus action of antigens of different nature on the fetus [1-5].

Objective. To establish the distribution of structures glycosaminoglycans in rat spleen in normal and after intrauterine injection of antigens of different nature by using of experimental models.

Materials and methods. The object of the study was 196 spleen of white rats aged from 1st to 90th day of postnatal life. Inside the fetus injection of antigens and saline by operational measures conducted by the method of M.A. Voloshin. For this purpose on 17-18 th day after insemination pregnant females midline laparotomy was done undere the anesthesia, adhering to all the rules of aseptic and antiseptic. Fetus, which were getting from the abdominal cavity through the uterus, through the shell, subcutaneously, in interscapular area and in amniotic fluid injected by 0.05 ml of the respective solution. Peritoneum and muscle layers were continually sewn by catgut seams. The animals were divided into 4 groups: - intact rats; II (control) – animals after inside the fetus injection of saline solution; III - rats, which injected by the vaccine Vaxigrip in utero; IV – animals which was injected by the vaccine of parotitis in utero. The whole complex of glycosaminoglycans founded by the alcyonic blue solution at pH 2,6 the critical concentration of MgCl2 0.2M. Differentiation of non-sulfated, low - and high sulfated compounds was performed after processing of sections of testicular hyaluronidase. Low- and high sulfated glycosaminoglycans distinguished with using of color sections solutions alcyonic blue with a critical concentration of MgCl2 0.6M, 0.2M.

Results and discussion. Newborn animals III and IV group in the capsule, trabeculae and stromal cells of splenic white pulp the total content of glycosaminoglycans greater due to the low sulfated forms and hyaluronic acid, compared with animals of intact group. Revealed changes in an organism of newborns after inside the fetus injection of antigen, regardless of route of injection and its nature, reflecting the imbalance in the terms and rate of formation of parenchyma and stroma [1, 3]. All groups of rats for 1 - the 90th day of observation the non-sulfated content decrease and increase the content of low- and high sulfated glycosaminoglycans. In the third and fourth groups accumulation of sulfated compounds occurs faster pace to 11 days. This difference is almost leveled, and the total content

of glycosaminoglycans increased on a 14 days in all groups. On the 21st day of life in the capsule, trabeculae high sulfated accumulation of glycosaminoglycans in the third group of animals runs faster. By the 90th day of life the difference between the accumulation of glycosaminoglycans in different groups was not found. This reflects a change of pace and timing of the formation of the local immune system. There is occurrence and the development of hyperplastic processes in internal organs, leading to advance their quality functional establishment (Which had previously been shown in studies of Ivanova N.E., Novosyolova O.A., Svetlitsky A.A., Chuhina S.V., Karzova M.V.). Undulating change of color intensity of SHYKpositive structures correlated with episodes of acceleration and deceleration organ morphogenesis. Backlog growth rates of thick muscular layer of the animals, injected with the antigen, was previously registered in the development of the small intestine, showing the inverse correlation with our results.

Conclusions. Newborn animals which were subjected to prenatal antigenic action, regardless of route of injection and the nature of the antigen, reduces amylase resistant glycoproteins and increased glycogen content in the structures of the spleen, which is observed on 45 days of life, compared to the intact group of rats, but rates leveled on 90 days. Newborn animals, antigen primed groups in the capsule of the spleen, the total content of glycosaminoglycans is more due to low sulfated forms, compared with animals intact group. The content of glycosaminoglycans increases the maximum 14 days in all groups. In rats during from 1 to 90 days of observation increases non-sulfated and decreases low sulfated and high sulfated and glycosaminoglycans for 90 days of life the difference between the accumulation of glycosaminoglycans graded.

So intro the fetus action antigen results in quantitative changes in the accumulation of

glycosaminoglycans low sulfated to 11 days of life, and high sulfated compounds on the first month of life, regardless of the antigen type, that may be a manifestation of qualitative imbalance in the formation of connective tissue.

Prospects for further research. Continued study of the role of immune mechanisms to monitor differentiation and maturation of cells of the whole organism in conditions of fetal antigen will help to determine the factors of risk of disturbances in the mother-placenta-fetus as a result of infection of the fetus during pregnancy.

References:

1. Voloshin NA. Grigoryeva EA, Kushh OG. Vnutriutrobnoev vedenie antigena - model' dlja izuchenija roli limfocitov v procesah morfogeneza vnutrennih ogranov. Zaporozh. med. zhurn. 2005;(3):12.

2. Voloshin NA. Limfocit - faktor morfogeneza. Zaporozh med zhurn. 2005;(3):122.

Grigor'eva EA, Dovgal' GV. Izuchenie 3. reaktivnosti timusa, selezenki, limfouzlov i limfoidnojtkani, associirovannoj s kishechnikom, poslehronicheskogo vvedenija kardiotropnogo preparata. Ukr. morfologichnij al'manah. 2013;13(3):8-11.

4. Matveyshina TM, Talanova OS, Grinivec'ka NV. Osoblivosti morfogenezu vnutrishnih organiv shhura pislja vnutrishn'outrobnogo vplivu inaktivovanoï antivirusnoï vakcini. Ukr morfologichnij al'manah. 2011;9(3):180-2.

5. Voloshin NA, Grigor'eva EA, Shherbakov MS. Vnutriutrobnaja antigennaja stimuljacija kak model' dlja izuchenija simptomokompleksa visceromegalin. Tavricheskij mediko-biologicheskij vest nik. 2006;9(4):57-79.

6. Mislic'kij VF, Tkachuk SS, Tkachuk OV. Patogenetichni osnovi vnutrishn'outrobnih infekcij. Klinichna ta eksperimental'na patologija. 2011;10(2)1:137-41. DDC-UDC 616.36-003.826:615.036.8

DOI:10.19221/2017424

Pivtorak K.V.

National Pirogov Memorial Medical University, Department Clinical Pharmacy and Clinical Pharmacology, Vinnytsya, Ukraine, ek3727@gmail.com

Mazur I.A.

Voloshin M.A.

Zaporizhzhia State Medical University, Zaporizhzhia, Ukraine

CORRECTION OF METABOLIC DISORDERS CAUSED BY NON-ALCOHOLIC FATTY LIVER DISEASE

Abstract. We have developed an effective way to correct metabolic disorders caused non-alcoholic fatty liver disease, by selecting medical remedies, considering peculiarities of the pathogenetic mechanisms of the development of metabolic disorders in this disease. In order to correct metabolic disorders in non-alcoholic fatty liver disease, a biologically active compound of (S) -2.6-diaminohexanoic acid 3-methyl-1,2,4-triazolyl-5-thioacetate was used in the experiment with rats with steatosis in a dose of 50 mg / Kg (solved with Ringer-Locke solution to 25 ml / kg) intraperitoneally once daily for 30 days. The study established that a biologically active compound of (S) -2.6-diaminohexanoic acid 3-methyl-1,2,4-triazolyl-5-thioacetate in a dose of 50 mg / kg has a high hepatoprotective and anti-hepatotoxic activity, which provides useful properties in the treatment of non-alcoholic fatty liver disease. **Key words:** liver diseases, steatosis, treatment

Introduction. In non-alcoholic fatty liver disease (NAFLD), an excessive mobilization of free fatty acids from peripheral depots of lipids and their ingress into hepatocytes develops. This phenomenon is caused by a tissue decreased sensitivity to insulin and disorders in glucose supply to cells, which ultimately leads to an increase in lipolysis rate in the adipose tissue with an increase in the concentration of free fatty acids in the blood (Randl biochemical cycle) [1]. Free fatty acids, in turn, disturb the endothelial function due to the production of free radicals, activation of protein kinase C, and increased dyslipidemia. In this regard, the liver can be considered both as the target organ and as a direct source of proinflammatory cytokines, which determine the cascade of inflammatory reactions, which lead to a damage to the smooth muscle cells, endothelial dysfunction and a damage to the hepatocytes themselves, thus forming a "vicious circle" [2].

To date, there is no doubt that liver steatosis and non-alcoholic steatohepatitis are severe stages of NAFLD associated with metabolic disorders. There are reports that the liver inflammation is induced by its steatosis. Endoplasmic reticulum and oxidative stress are responsible for this process [8]. A stress of the endoplasmic reticulum in the liver and adipose tissue was simulated in mice with genetically determined and induced by a diet forms of obesity. It turned out that this process leads to a disorder in the insulin signaling pathways. Hepatocytes constitute about 2/3 of the total number of liver cells, and other cellular elements are represented by biliary epithelial cells, sinusoidal endothelial cells, Kupffer cells, star cells, dendritic cells, and by lymphocytes.

Recent studies have shown the role of hyperhomocysteinemia in the development and progression of NAFLD [5, 7]. Due to the multifactorial and heterogeneous nature of nonalcoholic fatty liver disease, the therapeutic approaches should be comprehensive as well.

A known way to prevent the progression of the pathological process in the liver of patients with NAFLD is to administer antioxidants to themascorbic acid and vitamin E (tocopheryl acetate) in medium therapeutic doses [4]. With the use of this method, improvement of lipoperoxidation indexes and reduction of the terms of further progression of the pathological process in the liver were noted, however, in 15-20% of cases, the pathological process in the liver parenchyma of patients with NAFLD progresses, which contributes to the formation of fibrosis or even cirrhosis of this organ.

In the treatment of NAFLD differentiated use of drugs that have a pronounced anti-oxidant, antimembrane-protective, inflammatory, immunomodulatory properties is pathogenetically justified and they have a positive therapeutic effect on many links of the disease pathogenesis. Today an original drug was created by synthesizing the active substance of (S) -2,6diaminohexanoic acid 3-methyl-1,2,4-triazolyl-5thioacetate (its working title is Angiolin), which combines fragments of molecules of Thiotriazoline and L-lysine aescinat in its structure and has high antiischemic, cardioprotective, neuroprotective, antioxidant and antiinflammatory properties [6]. Intravenous administration of angiolin to animals with myocardial ischemia led to normalization of the ratio of thiol-disulfide system and nitric oxide system in the myocardium, as well as an increased activity of endothelial NO synthase, decreased nitrotyrosine levels, increased levels of reduced glutathione and cysteine, and an increased glutathione reductase activity [3]. Applying biologically active compound Angiolin in the comprehensive treatment of NAFLD is rational in terms of its effect on metabolic processes occurring in the liver, and to correct the endothelial dysfunction as well as to prevent cardiovascular complications.

Objective. To determine the effectiveness of the correction of metabolic disorders in NAFLD by means of biologically active compound Angiolin.

Material and methods. Experimental studies involved 50 white non-linear male rats weighing 180-200 g. Before the experiments, the animals had been kept in guarantine for 10 days. During this period, animals had received an adequate standard semisynthetic starch-casein diet. Subsequently, the animals were divided into 2 groups: the control one included10 intact animals, which continued to be on the same diet under the conditions similar to those of the experimental group, and the experimental group, consisting of 40 rats, in which a model of liver steatosis was created by keeping them for 8 weeks on a hypercaloric diet high in fat and in cholesterol containing about 30% fat (mostly saturated lipids) with cholesterol (obtained by mixing 2 g of cholesterol and 10 g of pork fat from 88 g of normal balanced diet granules) [Kucera O. Experimental models of non-alcoholic fatty liver disease in rats / O. Kucera, Z. Cervinkova // World J. Gastroenterol. - 2014. - Vol. 20, № 26. - P. 8364-8376]. After creating the liver steatosis model for the animals, they continued to be kept on a highfat diet, but part of the animals of the experimental group (20 rats) were administered additional 4 weeks of biologically active compound Angiolin in a dose of 50 mg per kg of their body weight (solved with Ringer-Locke solution to 25 ml / kg) intraperitoneally , and a part of the animals (20 rats) were only injected the Ringer-Locke solution (25 ml 1 kg) intraperitoneally for 30 days.

On the 30th day after the NAFLD model was developed, all animals were taken serum samples under thiopental anesthesia (40 mg / kg) for biochemical studies and samples of the liver tissue for morphological examination. After the centrifugation the blood serum was checked according to unified conventional methods for: the activity of enzyme markers of cytolysis (alanine aminotransferase, aspartate aminotransferase) and cholestasis (alkaline phosphatase, the level of total bilirubin and its fractions), the protein synthesis of the liver (total protein, albumins).

Results and discussion. At present, the properties of (S) -2,6-diaminohexanoic acid of 3-methyl-1,2,4-triazolyl-5-thioacetate to correct metabolic disturbances with NAFLD have not been described in the scientific literature, and no mention was made of the medical use of the substance in the NAFLD treatment scheme.

Using biologically active compound (S) -2,6diaminohexanoic acid of 3-methyl-1,2,4-triazolyl-5- thioacetate 50 mg / kg (solved with solution Ringer-Locke 25 ml / kg) once a day for 30 days can reduce cytolysis syndrome (reduce such biochemical parameters as the activity of alanine aminotransferase, aspartate aminotransferase, gamma-glutamyl transpeptidase) to reduce cholestasis syndrome (decrease in alkaline phosphatase), leads to normalization of protein synthesis liver function (levels of total protein, albumins, albumin / globulin ratio) to improve the morphological status of hepatocytes, indicating normalization of structural and functional state of the liver and thus leads to the achievement of the technical effect, that increases the effectiveness of therapy.

The results of the experiment showed that the test compound has hepatoprotective effect. Studying the intensity of the cytolysis syndrome in rats while correcting the experimental model of NAFLD showed that the activity of the alanine aminotransferase was lower in the use of angiolin (by 17.3%, p <0.05) compared to untreated animals with the NAFLD model. The gammaglutamyltranspeptidase activity was also lower compared to untreated animals when the compound was used (table 1), namely: by 32.4% at the time of administration of Angiolin (p < 0.05). The activity of aspartate aminotransferase did not approach the control values when using the compound, however, this index was higher by 21.3% and statistically differed by 8.7% (p < 0.05) from that in untreated animals after the administration of angiolin.

Since the general indirect bilirubin rate and alkaline phosphatase activity are the biochemical

markers of cholestasis syndrome, we used these rates to assess the effectiveness of Angiolin (table 2). The indicator that most clearly presented the cholestasis syndrome in rats with modeled NAFLD was the activity of alkaline phosphatase, which was by 31.6% higher (p <0.05) in untreated animals compared to the intact group. When Angiolin was administered the activity of alkaline phosphatase was lower (by 27.6%, p <0.05) compared with the untreated group. Studying the content of general and indirect bilirubin, we did not establish statistically significant differences with the use of Angiolin (table 2).

The total protein rate was most closely related to that in animals of the intact group with administered Angiolin (p <0.05). A similar trend was observed in determining the albumin content. Albumin content was higher with administered Angiolin (by 30.9%, p <0.05) compared to non-treated NAFLD models and close to that in intact animals. When using Angiolin, a larger albumin / globulin ratio was recorded, the difference in the group of untreated animals using angiolin was 31.3% (p <0.05) (table 3).

Table 1

Features of the biochemical parameters of the cytolysis syndrome in rats with modeled NAFLD and after its correction by angiolin of ((S) -2,6-diaminohexanoic acid of 3-methyl-1,2,4-triazolyl-5-thioacetate) (M + m)

	/ \ /		
	Intact rats (n=10)	Rats with modeled NAFLD	
		No treatment	Correction with
		(n=10)	Angiolin (n=10)
Aspartate aminotransferase, (un/l)	160,26±14,72	223,08±6,53*	203,74±5,37*#
Alanine aminotransferase (un/l)	182,43±12,38	241,62±17,72*	199,85±7,35#
gamma-glutamyltranspeptidase (un/l)	9,86±0,32	15,62±0,86*	10,56±0,44#

Note: * - statistically significant difference with indices in intact animals (p<0,05); # - statistically significant difference with indices in animals with modeled NAFLD without treatment (p<0,05);

Table 2

Features of biochemical parameters of cholestasis syndrome in rats with modeled NAFLD and after its correction by angiolin of ((S) -2,6-diaminohexanoic acid of 3-methyl-1,2,4-triazolyl-5-thioacetate) (M + m)

(14) ± (11)					
	Intact rats (n=10)	Rats with modeled NAFLD			
		No treatment	Correction with		
		(n=10)	Angiolin (n=10)		
Alkaline phosphatase (un/l)	381,16±24,14	557,33±23,24*	403,45±23,24#		
Total bilirubin (µmol / L)	8,63±0,51	9,83±0,62	8,68±0,47		
Indirect bilirubin (µmol / L)	4,74±0,52	4,84±0,54	4,75±0,49		

Note: * - statistically significant difference with indices in intact animals (p<0,05); # - statistically significant difference with indices in animals with modeled NAFLD without treatment (p<0,05);

Table 3

Features of protein synthesis liver function in rats with modeled NAFLD and after its correction by angiolin of ((S) -2,6-diaminohexanoic acid of 3-methyl-1,2,4-triazolyl-5-thioacetate) (M ± m)

	liptact rate	Rats with modeled NAFLD		
	(n=10)	No tratment	Correction with	
		(n=10)	Angiolin (n=10)	
Total protein(g/l)	82,45±1,15	67,14±2,07*	79,18±2,13#	
albumins (g/l)	49,18±2,36	31,16±2,68*	45,12±1,54#	
albumins/globulins ratio	1,61±0,14	0,90±0,08*	1,31±0,22#	

Note: * - statistically significant difference with indices in intact animals (p<0,05); # - statistically significant difference with indices in animals with modeled NAFLD without treatment (p<0,05);

The results of the morphological study of liver tissue in experimental animals with modeled NAFLD against the background of the introduction of biologically active compound of (S) -2,6diaminohexanoic acid of 3-methyl-1,2,4-triazolyl-5-thioacetate 50 mg / kg show the recovery of lobular structure of the liver parenchyma compared to animals with a modeled NAFLD without correction. As an evidence of recovery processes activation in the liver during treatment with biologically active compound of (S) -2,6diaminohexanoic acid of 3-methyl-1,2,4-triazolyl-5-thioacetate was a significant intensification of dual hepatocytes mass index, which was reliably higher than in animals with modeled NAFLD without correction, reliably more functional nuclear cell index than in the animals with modeled NAFLD without correction. Thus, the effectiveness of the correction method was proved by the experimental research.

Conclusion. This study found that a biologically active compound of (S) -2,6-diaminohexanoic acid 3-methyl-1,2,4-triazolyl-5-thioacetate in a dose of 50 mg / kg has a high hepatoprotective and antihepatotoxic activity which provides useful properties in the treatment of NAFLD. The new properties of Angiolin allow performing an effective therapy of experimental liver damage - NAFLD, and the invention can be used in medicine.

Prospects of further research. It would be

perspective in the future to investigate how Angiolin affects the function of endothelial cells of the liver sinusoids and releasing biologically active substances produced by the endothelium.

References:

1. Voloshin NA. Grigoryeva EA, Kushh OG. Vnutriutrobnoev vedenie antigena - model' dlja izuchenija roli limfocitov v procesah morfogeneza vnutrennih ogranov. Zaporozh. med. zhurn. 2005;(3):12.

2. Voloshin NA. Limfocit - faktor morfogeneza. Zaporozh med zhurn. 2005;(3):122.

Grigor'eva EA, Dovgal' 3. GV. Izuchenie reaktivnosti timusa, selezenki, limfouzlov limfoidnojtkani, associirovannoj s kishechnikom, poslehronicheskogo vvedenija kardiotropnogo Ukr. preparata. morfologichnij al'manah. 2013;13(3):8-11.

4. Matveyshina TM, Talanova OS, Grinivec'ka NV. Osoblivosti morfogenezu vnutrishnih organiv shhura pislja vnutrishn'outrobnogo vplivu inaktivovanoï antivirusnoï vakcini. Ukr morfologichnij al'manah. 2011;9(3):180-2.

5. Voloshin NA, Grigor'eva EA, Shherbakov MS. Vnutriutrobnaja antigennaja stimuljacija kak model' dlja izuchenija simptomokompleksa visceromegalin. Tavricheskij mediko-biologicheskij vest nik. 2006;9(4):57-79.

6. Mislic'kij VF, Tkachuk SS, Tkachuk OV. Patogenetichni osnovi vnutrishn'outrobnih infekcij. Klinichna ta eksperimental'na patologija. 2011;10(2)1:137-41. DDC-UDC 616.314 - 002.4 - 06:616.34] - 053.2 - 07 - 08

Rozhko V.I.

Department of Therapeutic Dentistry, HSEIU "Bukovinian State Medical University", Chernivtsi, Ukraine

RESEARCH OF CONTENT CORRELATION OF IMMUNOGLOBULINS AND LISOZYME IN ORAL FLUID OF CHILDREN WITH RAMPANT CARIES AGAINST THE BACKGROUND OF GASTRO-INTESTINAL DISEASES

Abstract. The article presents the results of examination of children with rampant dental caries against the background of the gastrointestinal tract diseases. The average values of immunoglobulins A, G, secretory immunoglobulin A in oral fluid of the main, comparative and control groups were determined and the data were analyzed (with lysozyme indices content) in relation to the age of children. The results will be used to develop therapeutic and prophylactic program. **Key words:** immune status, caries, gastrointestinal tract.

Introduction. Any pathological process, and especially chronic, is always associated with indices of immunoreactivity of the organism as a whole or with the level of local immunity factors in the nidus of the disease. In diseases of the gastrointestinal tract (GIT), the level of immunoglobulins and lysozyme in the oral fluid deviates from the norm, which is likely to be a trigger for the development of rampant caries in children. A detailed study of this aspect makes it possible to directly influence the inhibition of the pathological process, which is important in the formulation of therapeutic tactics.

Objective. To determine the level of IgA, IgG, sIgA, lysozyme in children with rampant caries against the background of pathology of the gastrointestinal tract; to compare these data in infants with intact teeth against the background of GIT diseases and dentally and somatically healthy children.

Materials and methods. In order to study local resistance in rampant caries against the background of the gastrointestinal tract disorders, certain immunity factors in the oral fluid in children were investigated. The oral fluids were collected on an empty stomach by spitting into a measuring tube (1.5ml). The level of immunoglobulins A, G and sIgA in the oral fluid was determined by radial immunodiffusion in the agar by Mancini method. Monospecific standard antisera to the main classes of immunoglobulins were used in the reaction [1, 2, 3]. The lysozyme concentration in the oral fluid was studied by diffusion method in the agar containing 0.05% Micrococcus lysodeikticus biomass powder.

For an objective assessment of the research results reliability, statistical processing of the obtained data was conducted by means of the commonly used methods of variation statistics using the package of statistical programs "Statgraphic 2.3" and "Microsoft Excel 2000" [4, 5].

Results of the research and their discussion. The study of the immunological status of oral fluid in children of the study groups showed (Figure) that in dentally and somatically healthy children (control group) the IgA content in the oral fluid was on average 0.18±0.03 g/l. In children with





intact teeth against the background of GIT disorders, IgA concentrations in the oral fluid were lower in relation to the control group data and equaled to 0.14 ± 0.02 g/l (p>0.05). In children with rampant caries against the background of the GIT diseases the IgA level in the oral fluid was equal to 0.9 ± 0.03) g/l.

The lowest values of IgG concentration were detected in children of the control group (0.2±0.04) g/l, and these data were lower than in children of the comparative group (0.3±0.02) g/l (p<0.05) and lower than those in children of the main group (0.35±0.04) g/l (p<0.05). The maximum values of secretory IgA in the oral fluid were observed in children of the control group (0.35±0.02) g/l. In children with GI diseases sIgA concentration was significantly lower and equaled to 0.23±0.03 g/l in persons with intact teeth and 0.21±0.03 g/l in children with rampant caries (p<0.01). In dentally and somatically healthy children of the control group the lysozyme concentration in the oral fluid was $23.1\pm1.04 \mu g/l$, that was higher than that in children with intact teeth of the comparative group (17.9 \pm 1.08) μ g/l (p<0.01) and exceeded the data in children with rampant caries of the main group (15.28±1.06) µg/l (p<0.01).

The next stage of the work was to study the immunological state of oral fluid in children of study groups, depending on age. The concentration of secretory immunoglobulin A in the oral fluid in children with gastrointestinal diseases decreased with increasing age of the examined patients, however, in persons with rampant caries this process was more dynamic.

The decrease in lysozyme activity in the oral fluid with increasing age in children with GI diseases was studied. Thus, in children of the main group the lysozyme activity in the oral fluid decreased from $14.80\pm1.13 \mu g/l$ in 6-9 year old children to $14.30\pm1.10 \mu g/l$ in 10-12 year old children and equaled to $13.05\pm1.10 \mu g/l$ in 13-15 year old adolescents. At the same time, in patients of comparative group the lysozyme activity in 6-9 year old children was $17.90\pm1.09 \mu g/l$, in 10-12 year old patients it was $17.05\pm1.08 \mu g/l$ and in 13-15 year old adolescents it equaled to 15.50 ± 1.09

μg/l.

Conclusions. Thus, the results of the study of the immunological status in children with gastrointestinal tract diseases showed the decrease in the concentrations of slgA and lysozyme in the oral fluid of the examined patients, indicating low bactericidal, antiviral and toxicogenic properties of the oral fluid; IgA deficiency can indicate the presence of allergic, autoimmune diseases; increased IgG synthesis is a response to a chronic infection or indicates an autoimmune disease. It was noticed that the given immunological imbalance was more pronounced in children with rampant caries than in persons with intact teeth against the background of the gastrointestinal diseases.

Prospects for further research. Based on the received data on the immunological status of oral fluid in children with rampant caries against the background of gastrointestinal diseases, the development of a treatment and prevention program is planned after consultation with immunologists. Therapy results will be reviewed after 6, 12 and 24 months from the start of treatment. This technique is expected to increase the level of local immunity in the oral cavity, thereby destroying favorable conditions for the development of pathogenic microflora and the progression of rampant caries.

References:

1. Giljazeva VV. Immunologicheskie aspekty kariesa zubov. Obzor. Klinicheskaja stomatologija. 2010;(4):76-9.

2. Ljuta VA. Mikrobiologija z tehnikoju mikrobiologichnih doslidzhen' ta osnovami imunologii: u 2–h kn. Kn. 1: Zagal'na mikrobiologija K: Zdorov'ja; 2006. 512 p.

3. Borovskoj EV, Leont'ev VK, redactors. Kuznecov EA, Capaev VN, Davydova MM. Mikrobiologija i immunologija polosti rta. Biologija polosti rta. M: Medicina; 1999. P. 226-60.

4. Kobzar' AI. Prikladnaja matematicheskaja statistika. M: Fizmatlit; 2006. 238 p.

5. Lapach SN, Gubenko NV. Statisticheskie metody v mediko-biologicheskih issledovanijah, Excel. K: Morion; 2000. 320 p. DDC-UDC 616.31+616-056.3:58.04

DOI:10.19221/2017426

Karavan Ya.R.

Candidate of Medical Sciences, Department of Orthopedic Dentistry, HSEIU "Bukovinian State Medical University", Chernivtsi, Ukraine

Havaleshko V.P.

Candidate of Medical Sciences, Department of Orthopedic Dentistry, HSEIU "Bukovinian State Medical University", Chernivtsi, Ukraine

UP-TO-DATE ANESTHETIC POSSIBILITIES IN DENTISTRY PRACTICE IN DIAGNOSIS OF THE PATIENT'S ALLERGIC STATUS

Abstract. This article highlights one of the anesthetic techniques in dentistry practice considering dental care provision for allergic patients in dentistry. It deals with antihistamine pharmaceutical medication revealed to be the prophylactic and anesthetic remedy in dental practice for the patients with positive diagnostic tests for allergen detection (immunothemistometria).

Key words: anesthesia, allergic reaction, "an immune and immune depression zones", dental practice.

Introduction. According to dental institute data sets of Ukrainian AMS, more than 30% of the dental patients are found to be in "a risk group" as those having an allergic reaction of different genesis [1]. Considering the findings of the World Health Organization, about 25 % of the Earth population is revealed to have the allergic reaction for medical preparations [2]. The world increases in new arrivals in all spheres of the human activity, including allergens which tend to renew, and their amount grows either. People start to refuse expensive natural thing prefer them to chemical equivalents. We make use of food products nourished with chemical fertilizers, the most of the machines constructed with artificial materials, not to mention the detergents that can cause the allergic reaction [3]. Many materials of the human activity are detected to have the non-specific and specific response of the human immune system. It can result in overloading the somatic disease progression, uppermost of the allergic nature [4].

Moreover, the allergic reaction may also occur to medications, likewise to the dental anesthesia at your dental visit [5]. The anesthesia, as well as the allergy to it, seem to be extended presently [6]. But at the same time, doctors and patients are still satisfied with the results of the anesthesia effect [7]. The extensive application of local anesthetic drugs at dental manipulations, as well as the use of different substances and materials in dentistry, lead to a rise of allergic diseases extension, increase the frequency of objectionable reactions to plastic [8, 9, 10], metals [11, 12], filling materials[13,14], impression masses[11], latex products (such as latex gloves) used in medicine [15] and in dentistry either[16, 17].

At his practice, which is frequently related to the work of allergy specialist, the dentist may detect a typical allergic reaction: associated with the delayed-type hypersensitivity mechanism followed by the contact dermatitis manifestation, especially to medications applied directly to the skin; associated with the Ige-dependent reaction accompanied by anaphylactic shock, Quincke's edema, hives and bronchial asthma [18, 19, 20]. Such reactions usually associated with the main symptoms of allergic diseases such as itching, edema, hyperemia, skin rash, bronchospasm, stuffy nose, sneezing, rhinorrhea, itching and reddened eyes, lacrimation, the generalized hives and Quincke's edema, anaphylactic shock [21]. Being identical in their clinical manifestations they can cause certain complications. To be guided only by the clinical picture of the disease, it appears to be difficult to perform a diagnosis in those particular cases [22].

At the same time, the maintenance of the "allergy" dental status is possible only under particular allergy tests, specific or non-specific, binding to allergens and performed in the allergy room [23]. In connection with aforementioned, the diagnostic interpretation of the received

results is to specify with an allergy specialist [24]. Thus, the laboratory techniques are preferable in allergy diagnostics, which is very safe to the patients with allergic diseases, rather high informational content, may be examined distantly and less amount of blood is required [26]. It is worthy of attention that the choice basis of laboratory methods of identification of the particular antigens depends on the leading type of the allergic reaction of the patient [27, 28]. (See the table below)

Table

Current methods of the laboratory diagnosis of the allergic diseases depending on a leading type of the allergic reaction.

Type of the reaction	The clinical manifestations of the AD (allergic diseases) in	Laboratory methods of identification
	dental practice	
The IgE-	anaphylactic shock, hives,	Basophil activation tests, the RAST
dependent	Quincke's edema, and	(radioallergo-sorbent test), the ELISA (enzyme-
reaction	bronchial asthma attack, latex	linked immuno-sorbent assay), immuno-
	allergy, atopic dermatitis	fluorescence tests, chemi-luminescent assays
		(MAST-test), immuno- themistometria, reverse
		passive hemagglutination test (RPHA)
IV delayed-	Contact dermatitis,	Reaction of lymphocytes blast formations,
type	erythemovesicular dermatitis,	leukocyte migration inhibition reaction, rosette
hypersensitivity	hemorrhagic vasculitis, latex	formation test, chemi- luminescent assay
	allergy	

The dentists should take into consideration the fact that neither positive nor negative results are not finally veritable while evaluating the findings [29]. In their general action, dental anesthetic drugs and their components – incomplete allergens, so called haptens, may transform into complete allergen after connection with their proteins and keep its ability to sensibilisation (hypersensitivity). Sensabilisation appears to be imperceptible and depends on the dosage of the material [30, 31]. Human body allergization under the constant contact with materials may result in changes of the immune system condition in the human organism [32, 33].

Therefore, the dentist should remember that he is responsible for prediction of the development of the allergic reaction risk in patients and have to detect the allergic reaction by all on hand means and use all informative methods available in the allergy room.

Anesthetic is an allergen, and there is no hypoallergic anesthetic drugs. Every patient planning the anesthesia may experience allergic response even to anesthetic drugs used several times earlier [34].

Regarding the aforementioned facts, the aim of

the present research has been formulated as the following – to survey the action of the one hypoallergic pharmaceutical medication revealed to be anesthetic in the patients having positive diagnostic assays to allergen detection (immunothemistometria).

Hypoallergic anesthetic drugs do not exist, but there are hypoallergic pharmaceutical medications that act as relievers.

We present our results of the investigation related the most urgent problem in dentistry. At the dental office, within 2002-2016 years 45 patients have been provided with the dental care. In the specialized allergic room, the allergic specialist diagnoses these patients to have allergic status: 30 patients have got 1-3 certificates that prove to perform diagnostic tests (immunothemistometria) for detecting allergen to medical anesthetic drugs and other medications (1st group), and 10 patients (2nd group) have got 3-6 certificates and in 5 patients the number of certificates goes beyond 10 (3rd group). The age of the patients ranges from 18 to 50, including 14 males and 31 females.

Five persons (3rd group) were provided with diagnostic tests at their every dental visit. The

special features of the records: tests, done to one and the same anesthetic drug, and conducted on different calendar days, reveal both positive and negative results. Special data charts, depicting "immune zones", and "immune depression gaps" were worked out for those patients.

The main complaints of the patients before the conducting anesthesia were fear to experience anesthesia, to suffer side effects such as itching of the cutaneous covering, edema of the mucous membranes of the oral cavity, heavy nasal breathing and clearly defined allergic rhinitis, conjunctivitis, hives, body temperature rise, a general feeling of being unwell, pain and discomfort feeling in the projection region of the dental manipulations performed by the doctor.

Hypoallergic anesthesia with a pharmaceutical medication was defined by an anesthetic duration and area, corresponding intraoral anesthetic techniques with dental anesthetic drugs.

The hypoallergic anesthetic pharmaceutical medications (antihistamine preparations) were administered to the patients of the $1^{st} - 2^{nd}$ groups (n = 40) during "an immune zone". The anesthesia performed to the patients of the 3^{rd} group with dental anesthetic drugs during the immunodepression gap give a positive response to diagnostic assays (immunothemistometria).

The treatment efficiency was evaluated regarding the patients' complaints such as increased anesthetic feeling of the oral cavity area, breath normalization, and absence of a headache, swelling signs of the mucous membranes of the oral cavity, tongue, pharynx, and nose.

The objective criteria claim that to conduct painless dental manipulations tend to be possible in the dental practice.

The following recommendations were advisable to all the patients undergone surgical interference: medical inspection during one hour within the dental office area with the feather stay at home, and forbidden car handling.

It should be mentioned, that during anesthesia with hypoallergic antihistamine medications in the 1st and 2nd group slightly positive allergic response (itching of the forearm skin) was revealed in one case. Considering this weak positive allergic reaction, the patient was suggested to perform anesthesia with another reasonable antihistamine medication required for conducting dental manipulation.

Now then, the number of the allergens and the number of the patients having allergic reactions increase gradually.

The dental specialists should remember that due to the dosage of the dental anesthetic materials, so-called haptens (incomplete allergens) may transform into complete allergens after connection with their proteins, and it is depended on the ability to sensibilization (hypersensitivity) since the latent manifestations of the human organism are also possible.

Positive allergic testing results prove that the organism has sensibilization to certain allergens only at present period of time (during twenty-four hours).

The laboratory methods of allergen diagnostics tend to be predominate due to their absolute safe to the patient having allergic diseases, sufficiently high informational value, a possibility of the distant examination, less amount of blood is required.

The level of sensibilization (hypersensitivity), depending on the part of the day and year, creates "immune and immune depression" zones, where the reaction to one and the same allergen revealed to have either positive or negative result.

To prevent unwanted reactions in the dental practice, antihistamine medications are to be reasonably administered only during the period of the "immune zone", as the preventive antiallergic drugs.

Finally, anesthetic regarded to be an allergen, and there are no hypoallergic anesthetic drugs. Planning the anesthesia to be performed in the dental practice, you may use antihistamine drugs as those to be hypoallergic pharmaceutical medications to get anesthesia effect of the oral cavity.

References:

1. Haitov RM, editor. Klinicheskaja alergologija. Rukovodstvo dlja prakticheskih vrachej. M: MEDpress-inform; 2002. 624 p.

2. Gawkrodger DJ. Investigation of reactions to dental materials. Br J Dermatol. 2005;153:479-85.

3. Barvinok AI, Zajkov SV. Problema pobichnoï diï medikamentoznih preparativ v anesteziologiï. Liki Ukraïni. 1999;(5):44-5.

4. Babahin AA, Volozhin AI, Bashir AO. Gistamin

– vysvobozhdajushhaja aktivnost' akrilovyh

plastmass. Stomatologija. 2003(6):8-11.

5. Kononenko JuG, Rozhko MM, Ruzin GP. Misceve znebolennja pri ambulatornih stomatologichnih vtruchannjah. Ivano-Frankivs'k; 2006.

6. Kononenko Ju.G., Rozhko N.M., Ruzin G.P. Mestnoe obezbolivanie v ambulatornoj stomatologii. Moskva: Kniga pljus; 2004. 352 s.

7. Nisheva ES, Akimova SL. Diagnostika allergicheskih reakcij na mestnye anestetiki i stomatologicheskie materialy. Stomatologija. 2009;(4):18-28.

8. Lebedev KA, Ponjakina ID, Mitronin AV. Diagnostika allergoneperenosimosti proteznyh materialov. Rossijskij stomatologicheskij zhurnal. 2005;(6):25–31.

9. Palijchuk IV. Rannja diagnostika viniknennja proteznih stomatitiv na osnovi vivchennja stanu miscevogo imunitetu ta pokaznikiv mikrobiocenozu rotovoï porozhnini u pacientiv do protezuvannja znimnimi konstrukcijami zubnih proteziv. Galic'kij likars'kij visnik. 2012;17(2)75-79.

10. loffe E. Problemy polimerizacii svetootverdevajushhih kompozitov. Zubovrachebnye zametki. 1994;(2):16-25.

11. Gozhaja LD. Allergicheskie zabolevanija v ortopedicheskoj stomatologii. M: Medicina; 1988. 160 p.

12. Volozhin AI, Babahin AA. Immunomodulirujushhaja aktivnost' stomatologicheskih materialov lozhin. Stomatologija. 2006.(1):18-20.

13. Borisenko AV, Nesprjad'ko VP. Kompozicionnye plombirovochnye i oblicovochnye materialy v stomatologii. K: Kniga pljus; 2001. 314 p.

14. Gushhina OO. Gistaminosvobozhdajushhaja i immunotropnaja aktivnost' past, primenjaemyh dlja zapolnenija kornevyh kanalov (jeksperimental'no-klinicheskoe issledovanie) [Avtoref. dis. kand. med. nauk]. 2006. 20 p.

15. Rojas-Alcayaga G, CarrascoLabra A, Danús P. Determinationof susceptibility to sensitization to dental materials in atopic and non-atopic patients. Med Oral Patol Oral Cir Bucal. 2012;1(2):34-42.

16. Dubova LV, Volozhin IA, Babahin AA. Biosovmestimost' stomatologicheskih materialov – ocenka bezopasnosti po sposobnosti k gistaminoliberacii. Stomatologija. 2006;(2):8.

17. Radlinskij SV. Restavracija zubov materialami «Dentsplaj»: adgezivnaja tehnika DentArt. 1996;(2):26-31. 18. Haitov PM, Pinegin BV. Osnovnye principy immunomodulirujushhej terapii. Allergija, astma i klinicheskaja immunologija. 2000;(1):9-16.

19. Haitov PM. Klinicheskaja alergologija. – M: 2002. p. 145-165.

20. Anderson A. Allergic reactions to drugs and biological agents. JAMA. 1992;268(I):2845.

21. Nezabudkin SN. Antonova TI, Kartasheva NP. Sravnitel'naja diagnosticheskaja znachi- most' razlichnyh allergodiagnosticheskih testov. Med. immunologija. 2000;2(2):183-195.

22. Nisheva ES, Akimova SL. Diagnostika allergicheskih reakcij na mestnye anestetiki i stomatologicheskie materialy. Stomatologija. 2009;(4):18-28.

23. Puhlik BM, Anisimov MV, Rimarchuk OM. Medikamentozna alergija v stomatologichnij praktici. Nedoocinena nebezpeka. Medichni perspektivi. 2009;19(2):4-7.

24. Mallo Pérez L, Díaz Donado C. Intraoral contact allergy to materials used in dental practice. A critical review. Med Oral. 2003;(8):334–347.

25. Lipasova TB. Kliniko-laboratornaja ocenka pokazatelej rotovoj zhidkosti pri ortopedicheskom lechenii [Avtoref. dis. ... kand. med. nauk]. M; 1998. 18 p.

26. Puhlik BM. Lekarstvennaja allergija i pobochnye jeffekty lekarstvennyh sredstv v allergologii. L'viv : Medicina svitu; 2008. 107 p.

27. Patterson R. Allergicheskie bolezni (diagnostika i lechenie). M: Geotar; 2000. 734 p.

28. Barvinok AI, Zajkov SV. Problema pobichnoï diï medikamentoznih preparativ v anesteziologiï. Liki Ukraïni. 1999;(5):44-45.

29. GINA Report, Global Strategy for Asthma Management and Prevention. 2006.

30 Mallo Pérez L, Díaz Donado C. Intraoral contact allergy to materials used in dental practice A critical review. Med Oral. 2003;8:334-47.

31. Novikov DK. Lekarstvennaja allergija. M: 2001; 313 p.

32. Barvinok AI, Zajkov SV. Chastota i struktura medikamentoznoï alergiï v anesteziologichnij praktici. Imunologija ta alergologija. 1998;(4):74-6.

33. Pavlenko SA. Diagnostika alergichnih reakcij na zneboljujuchi preparati v klinici terapevtichnoï stomatologiï. Aktual'ni problemi suchasnoï medicini. 2009;12.4(40):40-4.

CONTENT:

Galagdina A.A., Dmytrenko R.R., Bambuliak A.V. Diagnostics of ischemic-reperfusion damage of the brain in rats afflicted with diabetes mellitus	3
Guranych S.P., Voronych-Semchenko N.M., Guranych T.V. Macro- and microelement status of rats with insulin resistance against the ground of iodine deficiency	6
Fedyshyn T.V., Maliar V.V., Maliar V.A. Peculiarities of utero-placental blood circulation formation in women with spontaneous and recurrent miscarriages associated with vagina dysbiosis	10
Rusnak V.F., Bedyk V.V. Growth of the pharynx at the end of the fetal stage of human ontogenesis	13
Teplytskyi S.S. Formation and development of the skin on the palmar surface of the hand throughout the period of prenatal ontogenesis and its importance in dermatoglyphics	16
Tkachuk N.P., Bilookyi V.V., Gyrla Ya.V., Sheremet M.I. Evaluating the efficiency of the scale for prediction of post-operational relapse in patients with nodular goiters	20
Yemelyanenko N.R. Anatomical transformations of the nasal septum in childhood	24
Kavun M.P. Morphogenesis of the hepatic-duodenum ligament in early ontogenesis of the human	26
Kotyuzhinskaya S.G., Umansky D.A. Functional state of lipitransport system in patients with athersclerosis with fatty load	28
Lomakina Yu.V., Burdeina M.P. Stress-associated changes in the excretory function of the kidneys in old rats under the conditions of a usual light period	32
Malyar V.V. Structural and functional features of fetal membranes in pregnant women with moderate idiopathic oligo- and polyhydramnios	35
Nesterak R.V., Gasyuk M.B. Pilot investigation of the method of interactive training of patients at the stage of medical rehabilitation and treatment	38
Pecheryaga S.V., Marinchina I.M. Features of hemodynamic changes in spiral arteries with low placentation at the early gestational age	42
Pschychenko V.V., Cherno V.S., Frenkel Yu.D. The status of extraorganic blood flow in pineal gland of rats under conditions of acute stress and twenty-four hour darkness	44
Reshetilova N.B., Glubochenko O.V., Kulish N.M., Dudko A.G. Formation of anterior cerebral vesicle cavities at the 5th week of the embryonic period	47
Riznichuk M.O., Galitskaya V.O., Dyhodyuk Yu.V., Kravchuk Yu.V., Vakaryuk O.V. Prader-willi syndrome, diagnostics and currency features	50
Shalamay U.P., Pavlikivska B.M., Voronich-Semchenko N.M. The state of autonomous heart regulation in adolescents with light iodine deficiency and latent iron deficiency	52
Shutova N.A., Nikolayeva O.V., Sulkhdost I.O. Electromagnetic radiation impact on the cellular prottective mechanisms in experiment	58
Yasnikovska S.M., Hrytsak H. Evaluation of clinic-laboratory and ultrasonic research results in different forms of the chorion's pathology in the first three-month of gestation	61
Yashchyshyn Z.M., Zaiats L.M., Yurkiv I.Y., Maslyak K.T., Vodoslavska N.Y., Sikomas M.T. Changes in neuroglial interrelation of muscle-intestinal nerve plexus of esophagus after one-sided crossing of vagosympathetic trunk	64
Navarchuk N.M., Kosteniuk S.V. Morphogenesis of the dentognathic apparatus during the early times of the human ontogenesis	67
Rusnak V.F., Bedyk V.V. Features of pharyngeal morphogenesis in five-week embryos	70
Talanova O.S, Apt O.A. Specifics of distribution of glycosaminoglycans in the white pulp of the spleen and stroma of rats after experimental modeling injection inside the fetus of antigens of different pature.	72
Pivtorak K.V., Mazur I.A., Voloshin M.A. Correction of metabolic disorders caused by non- alcoholic fatty liver disease	74
Rozhko V.I. Research of content correlation of immunoglobulins and lisozyme in oral fluid of	78
children with rampant carles against the background of gastro-intestinal diseases Karavan Ya.R., Havaleshko V.P. Up-to-date anesthetic possibilities in dentistry practice in diagnosis of the patient's allergic status	80



Bibliographic information published by the Deutsche Nationalbibliothek The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet athttp://dnb.dnb.de

> № 4/2017 – 28 Passed in press in September 2017



