AJPMHS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Pediatric Medicine and Health Sciences
Volume 01, Issue 03, 2023 ISSN (E): XXX-XXX

Morphofunctional Features of the Adrenal Structure in Norm and Under Various Impacts

Kadirova Laylo Valizhonovna
Bukhara Medical Institute

Abstract: Work was carried out on the analysis of literature and a selection of data from studies of Uzbek, Russian and foreign scientists, a comparison of the results obtained, the relationship between the impact of various pathological factors and morphological changes in the adrenal glands was noted.

Keywords: adrenal glands, pathology, morphology, glomeruli, medulla.

Relevance. Currently, the issue of the pathogenesis of damage and morphofunctional restructuring of the organs of the endocrine system under the influence of various pathological factors remains relevant. Under the influence of various exogenous factors on the body as a whole, a number of morphological and functional changes in the structure of the adrenal glands are noted, these can be a change in the ratio of the cortical layer in relation to the medulla, as well as morphological restructuring in three zones of the cortical layer as a whole or separately. It has been proven that structural and functional changes in the adrenal glands affect the entire body. The influence of physical and mental stress, magnetic fields of different frequencies [2,11,16], ionizing radiation [3], the influence of various forms of stress, such as immobilization [1], thermal [1,12,15], chronic [9,14], emotional, combined with simultaneous combined exposure to a carcinogen and stress [10]. The data of experimental studies on the occurrence of changes in the postnatal development of the adrenal glands of the offspring are described after chronic exposure of the mother to pesticides [5], prolonged prenatal stress [14], and temperature [1,3,12]. Particular attention is paid to the study of morphofunctional changes that occur in the adrenal glands during adaptation to stress. Most researchers recognize the fact that the neuroendocrine system plays a leading role in the formation of the body's adaptation to stress, the role of the adrenal glands as organs of stress markers is also confirmed, the response of the adrenal glands in the form of morphological changes in parameters remains the main link in the pathogenesis accompanying the development of the classical stress syndrome [1, pp. 212-214; 9, p.28-31; 12, p.5-11; 42, pp. 1146-1151; 33, pp. 233-239; 35, pp. 3503-3507]. Punina P.V., Kukharenko N.S. [15, p.592-594] note that any change in the conditions of keeping, transportation, feeding, constancy are external stimuli that require the activation of protective reactions, leading to stress. Stress is the body's response to external stimuli. Morphometric changes in the adrenal glands depend on the stage of stress, on the duration of exposure to the stress factor.

Depending on the nature of the interaction, stress is divided into temperature (heat, cold), neuropsychic, light, hunger, but regardless of the type of stress, the reaction of the adrenal glands to stress is a pattern. Umbetov T.Zh., Berdalinova A.K., Barsukov N.P. [17, p.5-11], studying the effect of stress on the structure of the adrenal gland, characterize the adrenal glands as one of the main organs of stress markers. Morphological changes that occur when exposed to stress are

accompanied by an increase in the mass of the adrenal glands, expansion of the vascular bed, which indicates an increase in the function of the gland.

Under the influence of various exogenous factors on the body as a whole, there are a number of morphological and functional changes in the structure of the adrenal glands, expressed by a disproportionate nature of changes in the dimensional characteristics of structural and functional zones, this can be a change in the ratio of the cortical layer in relation to the medulla, as well as morphological restructuring in three zones of the cortical layer as a whole or separately. Lencher O.S. [12, p.5-11] Abramova L.L., Mukhametov A.I. [1, pp. 212-214] describing the morphostructure of the adrenal gland under the combined effect of thermal and immobilization stresses, they came to the conclusion that the response of the adrenal glands to the effects of chronic stress is the remodeling of the cortex and adrenal zone of the adrenal glands, characterized by a decrease in the width of the glomerular and fascicular zones, a decrease in the area brain layer. Mete F., Kilic E., Somay A., Yilmaz B. [33, pp. 233-239] investigated the effect of heat stress on the adrenal glands by exposure to endogenously induced hyperemia. With hyperermia 39-410, changes were observed in the adrenal cortex, in the form of a slight edema in the adrenal cortex, moderate dystrophy. There was a significant decrease in the level of corticosterone in the blood serum. Many studies have been carried out recognizing the fact of the occurrence of morphofunctional changes at the level of the hypothalamic-pituitary-adrenal system that occur after exposure to ionizing radiation on the body [3,19]. The purpose of the study Shabdarbayeva D.M., Chayzhunusova N.Zh., Uzbekova D.E. [19 p. 141-150] was to study the changes that occur after radiation-induced damage to the adrenal glands, in which the scale of structural and functional changes in the adrenal glands depends on the dose and type of irradiation.

When studying the effect of long-term low-intensity ionizing radiation in combination with the cold factor on the morphological parameters of the adrenal cortex, Ermakova O.V. [3, p. 59-68], describes the occurring maximum morphometric changes, which indicates synergy in the combined action of chronic irradiation in combination with long-term cold exposure. In response to the combined effect of stressors, the reaction of the fascicular zone of the adrenal cortex occurs in the form of thickening due to hyperplasia and hypertrophy of hormone-producing cells, which indicates their increased secretory activity, this is due to the physiological action of glucocorticoid hormones, leading to the provision of energy materials necessary for cold exposure.

The consequence of female stress during pregnancy is manifested by persistent changes in the internal organs of the offspring, including the adrenal glands, of a morphometric and physiological nature and does not depend on the type of stress. Nikolaeva I.V., Belolyubskaya D.S. [14, p.68-73] studied the long-term effects of the influence of emotional stress in the late prenatal period on the development of the adrenal glands, a decrease in the thickness of the adrenal cortex was noted, which indicates complex restructuring of adaptation, the adaptive activity of the body as a whole. The influence of stress in embryogenesis contributes to increased production of glucocorticoids, which is the main cause of changes in the hypothalamic-pituitary-adrenal system in the postnatal period and is manifested by a reduced response to stress. Zokirova N.B., Tukhtaev N.K. [5, p.6-9] note that chronic intoxication of the maternal organism with pesticides leads to disruption of the formation of the endocrine system of the offspring, respectively, there are morphofunctional changes in the structure of the adrenal cortex, manifested by a slowdown in the rate of intrauterine and postnatal growth of the fascicular and reticular zones. The purpose of the study by Kostrova O.Yu., Stomenskaya I.S., Merkulova L.M., [10, p. the relative mass of the adrenal glands, vasodilatation of the medulla, a decrease in the level of cortisol, which indicates the stimulation of the functional activity of the cells of the adrenal glands. Most researchers [2,11,16,] recognize the fact of the harmful effects of electromagnetic waves, both at the cellular and at the organismal level. To simplify everyday life, we are exposed to a significant attack of electromagnetic radiation in industrial and domestic conditions using household appliances, stoves, vacuum cleaners, smartphones every day. There

are shifts in the endocrine, vascular, nervous systems, which are multidirectional. Kudryashov Yu.B., Alabovsky V.V., Perov S.Yu. [11] note that changes in the hormone-forming function of the adrenal cortex arising from the influence of electromagnetic exposure depend on the intensity of electromagnetic radiation, high doses depress, low doses stimulate the formation of hormones.

The level and degree of morphofunctional changes in the adrenal glands is directly dependent on both the magnitude and duration of magnetic induction. Slobodyanyuk I.L., Starodumov N.I., Machikhin V.A. et al. [16, p.48-52.] studying the effect of a constant magnetic field on the adrenal glands, in a magnetobiological experiment, came to the conclusion that under the influence of a constant magnetic field, morphofunctional changes in the adrenal cortex are observed in the form of an increase in the functional activity of the cortical layer. The effect of low-frequency alternating magnetic fields on the activity of the pituitary-adrenal system was described by Alabovsky V.V., Gotovsky M.Yu., Vinokurov A.A., Maslov O.V. [2, p.4-12], according to the authors, the resulting morphological and functional changes in the adrenal cortex manifested themselves in the form of activation of chromaffin tissue, the glomerular layer of the adrenal cortex, an increase in the nuclei of the glomerular, fascicular, reticular and medullary layers. Most authors recognize the fact of the influence of physical activity, more precisely sports activity, on the neuroendocrine regulation of body functions, manifested by hyperfunction of the hypothalamic-pituitary-adrenal system. Shaikhelislamova M.V., Sitdikov F.G., Sitdikova A.A., Kayumova G.G. [20, p.87-93] studied the effect of increased physical activity on the state of the adrenal cortex and puberty in boys. It was established that the effect of physical activity on the morphological and functional state of the adrenal cortex was manifested by the instability of the functional activity of the adrenal cortex in the form of a change in periods of increased production of glucocorticoids, periods of inhibition.

In domestic and industrial injuries, burns occupy one of the main places. A burn is a stress factor that leads to various changes in the body, including endocrine dysfunction. Changes in the adrenal glands that occur after burns are not well understood and remain relevant. Dzevulskaya I.V., Kovalchuk A.I., Malikov A.V. [A.new article p.39-45] studied morphological changes in the adrenal cortex of rats during experimental local thermal burns. The revealed dynamics of morphological changes in the adrenal cortex is associated with changes in the hemicapillaries and the surrounding tissue of the adrenal glands. The staging of morphological and functional changes occurring in the adrenal cortex was noted: microcirculation disturbance, tissue edema, dystrophic processes, regression. Mozerov S.A., Myalin A.N., Chekushin A.A., Yunyashina Yu.V. [p.46-53] in the morphometric study of the adrenal cortex in the early stages of burn disease, an increase in the cortical zones due to the glomerular and fascicular zones is noted, which leads to a change in the percentage ratio of the layers of the adrenal cortex. Morphological changes in the adrenal cortex in the early post-burn period are compensatory in nature, leading to morphological tissue restructuring. In the study of quantitative indicators in the adrenal cortex in burn shock, Chekushkin A.A., Myalin A.N. , Myalina S.A., Ivolgin N.E. [p.32-36] came to the conclusion that with the progression of burn shock, there is an increase in the width of the zones, changes in the percentage of layers, which indicates a high functional activity.

LITERATURE:

1. Abramova L.L., Mukhametov A.I. Morphophysiology of the adrenal gland under combined exposure to thermal and immobilization stress. // Proceedings of the OGAU - 2013 - No. 6 (44) - P. 212-214.
2. Alabovsky V.V., Gotovsky M.Yu., Vinokurov A.A., Maslov O.V. Reactions of the endocrine system (adrenal glands and thyroid gland) to the impact of alternating magnetic fields of low frequency. // Bioresonance therapy -2012 -№3(30) - P.4-12.
3. Ermakova O.V. Influence of long-term low-intensity ionizing radiation and cold factor on the morphological parameters of the adrenal cortex of murine rodents // Transactions of Karelian Research Center of Russian Academy of Science — 2021. №11. — P.59-68

4. Ermolina E.V. Morphological and functional characteristics of the hypothalamic-pituitary-adrenocortical and immune systems of the body of experimental animals under the influence of chromium and benzene: Abstract of the thesis. Diss ... Candidate of Medical Sciences - Orenburg, - 2013 - 24 p.
5. Zokirova N.B., Tukhtaev N.K. Morphological manifestations of the stress response of the adrenal cortex in conditions of chronic intoxication of the maternal organism // Journal of Theoretical and Clinical Medicine, -2016 - No. 6 - P. 6-9.
6. Izatulin A.V. Adaptive-compensatory changes in the structure of the adrenal glands in case of poisoning with acetic acid.// Acta Biomedica Scientifica, - 2011 - p. 199-202.
7. Islamov Sh.E., Yakubov M.Z., Norzhigitov A. Morphological changes in the adrenal glands with a single exposure to magnesium chlorate. // Journal of hepato-gastroenterological research -2021 - No. 3.1 (vol. II) - P.16-21.
8. Kashchenko S.A., Semenchuk S.N. Submicroscopic structure of the adrenal cortex after the use of methotrexate in the experiment // Morphological almanac named after V.G. Koveshnikova, - 2018, T. 16, - No. 2 - S. 23-27.
9. Korochkina E.A. Morphofunctional state of the testes and adrenal glands of rats under stress.// Genetics and breeding of animals -2014- No. 3- P.28-31.
10. O. Yu. Kostrova, I. S. Stomenskaya, L. M. Merkulova, G. Yu. Changes in the adrenal glands of female rats under combined exposure to a carcinogen and stress. // Repository of BSMU Collection of scientific papers.¬¬¬—2017 — P.295-299¬¬¬¬¬.
11. Kudryashov Yu.B., Alabovsky V.V., Perov S.Yu. Influence of electromagnetic radiation of the short-wave range on the functional state of the adrenal glands of rats. Bulletin of new medical technologies. Electronic magazine - 2015 - N 1
12. Lancher O.S. The state of hormonal and morphological indicators of the activity of the adrenal glands during cold adaptation.// Biological Sciences - 2016 - No. 5 - P.5-11
13. Moroz G.A., Shapovalova E.Yu., Kutya S.A. Structural and functional transformations in the adrenal glands of rats under the influence of gravitational overloads and protection from their action. // Bulletin of new medical technologies, electronic journal - 2018 - N 6 - P. 288-292.
14. Nikolaeva I.V., Belolyubskaya D.S. The influence of prenatal emotional stress on the development of the brain, adrenal glands and gonads of rats in postnatal ontogenesis.
15. Punina P.V., Kukharenko N.S. The influence of cold stress on the linear parameters of the adrenal glands of rats when using corrective drugs // Youth of the XXI century: a step into the future materials of the XVIII regional scientific and practical conference. - 2017 - S. 592-594.
16. Slobodyanyuk I.L., Starodumov N.I., Machikhin V.A., Polyakov V.A., Pichugina P.G., Kislyaev S.E., Konyukhov V.N., Antipova T.A. The influence of a constant magnetic field on the thymus and adrenal glands in a magnetobiological experiment // XX International Scientific and Technical Conference dedicated to the 75th anniversary of the Victory in the Great Patriotic War - 2020 - P. 48-52.
17. Umbetov T.Zh., Berdalinova A.K., Barsukov N.P. Influence of stress on the structure of the adrenal gland // Scientific works of the southern branch of the National University of Bioresources and Nature Management of Ukraine "Crimean Agrotechnological University" - 2012 - No. 142 - P.5-11.
18. Tsomartova D.A., Yaglova N.V., Yaglov V.V., Obernikhin S.S., Nazimova S.V., Sledneva Yu.P. Morphological changes in the reticular zone of the adrenal cortex and the secretory activity of its corticosterocytes in puberty in rats that developed under the influence of the

endocrine disruptor dichlorodiphenyltrichloroethane. // Morphological statements - 2018. - V.26 - Issue 2 -22-25.

19. Shabdarbaeva D.M., Chayzhunusova N.Zh., Uzbekov D.E., Auleisova S.K., Ruslanova B., Uzbekova S.E., Apbasova M.M. Radiation-induced damage to the adrenal gland. // Astana medical journals. - 2020. T, 104 - No. 2 - P. 141-150.
20. Shaikhelislamova M. V., Sitdikov F. G., Sitdikova A. A., Kayumova G. G. Effect of increased physical activity on the state of the adrenal glands and puberty in boys // Human Physiology, - 2014, V. 40, - No. 2, — pp. 87–93.
21. Yaglova N.V., Tsomartova D.A., Yaglov V.V. Features of the production of adrenal steroid hormones in the pubertal period in rats exposed to low doses of the endocrine disruptor DDT in prenatal and postnatal development. // Biomedical Chemistry - 2017 -Al- Derawi K.H. Effects of cadmium chloride on some endocrine glands (thyroid and adrenal) in male rats (Rattus norvegicus) // Iraqi Journal of Veterinary Sciences,— 2018 — Vol. 32,—№ 2,— P. 211-217.
22. Dekar-Madoui A., Aouichat S., Touati H., Ouali-Hassenaoui S. Chronic dehydration affects hydroelectrolytic equilibrium and adrenal gland morphology in wistar rat: comparison with gerbillus tarabuli. // Journal of Fundamental and Applied Sciences — 2017 .Vol.9 (№2) — P. 897-907.
23. Dzevulska I. V. Monthly rates of cell cycle of rat adrenal glands after burn and in administration of 0.9% nacl solution, lactoprotein with sorbitol and haes-lx-5% // Світ медицини та біології. — 2016.— № 1(55)— P. 126- 131.
24. Egalini F., Marinelli L., Rossi M ., Motta G. Prencipe N. Endocrine disrupting chemicals: effects on pituitary, thyroid and adrenal glands // Endocrine, —2022 — https://doi.org/10.1007/s12020-022-03076-x
25. Huang Y.M., Chi C.W., Wu P,S, Tai H.C., Chien M.N. Adrenal gland irradiation causes fatigue accompanied by reactive changes in cortisol levels // Journal of clinical medicine, — 2022 —Vol.11, 1214 — P. 1-15.
26. Imam R.A., Motawei A.G, Abd Algaleel W.A. Cadmium-induced adrenal cortical autophagy in rats: possible modulation by sildenafil. // Folia Morphol —2020. —79(4) — P 709-719
27. Kulbitska V. V. Histological changes of the adrenal glands vessels after experimental thermal trauma and under the conditions oflyophilized xenoskin use. // Biomedical and biosocial anthropology —2021—№42 —P. 12-17.
28. Mete F., Kilic E.,Somay A., Yilmaz B. Effects of heat stress on endocrine functions & behaviour in the pre-pubertal rat.// The Indian journal of medical research, — 2012 — 135(2) — P.233–239.
29. Nikukheslat S.D., Hamidian G.H., Khani M. The effect of endurance swimming exercise training on structural remodeling and apoptotic index of adrenal cortex in pregnant rats exposed to cadmium toxicity // Journal of Ardabil University of Medical —2017 — 17(4) — P. 497-513.
30. Kadirova L. V., Makhmudov Sh. S. PATHOPHYSIOLOGICAL APPROACH TO THE STUDY OF MOUNTAIN SICKNESS // BARKARORLIK VA ETAKCHI TADKIҚOTLAR ONLINE ILMIY JOURNALI. - 2022. - Vol. 2. - No. 4. - S. 8-12.
31. Kadirova L.V. FEATURES OF THE MACROSCOPIC CHARACTERISTICS OF THE ADRENAL GAS OF 3-MONTH-OLD WHITE RATS AFTER SEVERE BRAIN INJURY // Vestnik TMA — 2022.—No. 3,- P.80-82

32. Kadirova L.V., Nodirddinov D.M. FEATURES OF PATHOPHYSIOLOGICAL COURSE OF LONG-TERM COMPRESSION SYNDROME //BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI. - 2022. - Vol. 2. - No. 4. - S. 13-17.
33. Kadirova Laylo Valizhanovna, Temirov, Timur Ikhtiyarovich PATHOPHYSIOLOGICAL APPROACH TO THE STUDY OF ELECTRICAL INJURY // ORIENSS. 2022. No. Special Issue 4-2.
34. Kurbonova G.M. Questions of humanistic education in the works of teachers of Central Asia // Kazan Pedagogical Journal -2010. No. 5-6.- P.153-157
35. Kukharik E.A. Pedagogical views of Avicenna.//Materials of the international scientific conference Avicenna: thinker, scientist, humanist Minsk - 2013.- P.166-167
36. L.V. Kadyrova, G.Sh. Rakhimova "Some Aspects of the State of the Endocrine Glands of White Rats After Traumatic Brain Injury." CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURALSCIENCES. -2021. -FROM. 254-257.
37. Lazarevich N.A., Questions of medical ethics: from Avicenna to the present // Proceedings of the international scientific conference Avicenna: thinker, scientist, humanist. Republic of Belarus, Minsk - 2013.- P. 212-214
38. Laylo Valizhanovna Kadirova INTERACTIVE METHOD "BLITZ POLL" IN TEACHING THE SUBJECT PATHOLOGICAL PHYSIOLOGY, ON THE EXAMPLE OF THE TOPIC: "INFLAMMATORY" // Scientific progress. 2022. №2.
39. Olimova Aziza Zokirovna, (2021, July). COMPARATIVE CHARACTERISTICS OF THE MORPHOLOGICAL PARAMETERS OF THE LIVER AT DIFFERENT PERIODS OF TRAUMATIC BRAIN INJURY. In Euro-Asia Conferences (pp. 139-142).
40. Olimova Aziza Zokirovna. Частота Встречаемости Миомы Матки У Женщин В Репродуктивном Возрасте. JOURNAL OF ADVANCED RESEARCH AND STABILITY (JARS). Volume: 01 Issue: 06 | 2021. 551-556 p
41. Olimova Aziza Zokirovna, Sanoyev Bakhtiyor Abdurasulovich. OVARIAN DISEASES IN AGE OF REPRODUCTIVE WOMEN: DERMOID CYST. Volume: 01 Issue: 06 | 2021. 154-161 p
42. Olimova Aziza Zokirovna. РЕПРОДУКТИВ ЁШДАГИ ЭРКАКЛАРДА БЕПУШТЛИК САБАБЛАРИ: БУХОРО ТУМАНИ ЭПИДЕМИОЛОГИЯСИ. SCIENTIFIC PROGRESS. 2021 й 499-502p
43. Olimova Aziza Zokirovna .MACRO- AND MICROSCOPIC STRUCTURE OF THE LIVER OF THREE MONTHLY WHITE RATS. ACADEMIC RESEARCH IN EDUCATIONAL SCIENCES /2021 й. 309-312 p
44. Sanoyev Bakhtiyor Abdurasulovich, Olimova Aziza Zokirovna. Pathology of Precancerous Conditions of the Ovaries in Women of Reproductive Age. Volume: 01 Issue: 06 | 2021.