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Normal Morphofunctional Characteristics of the Adrenal Glands in Patients With Rheumatoid Arthritis

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Relevance of the study. The adrenal glands are vital organs, the complete removal or destruction of which by a pathological process leads to changes that are not suitable for life and death, which is why they are often called "life glands". Functions of the adrenal glands. - production of mineralocorticoids (aldosterone, deoxycorticosterone acetate, etc.), regulation of water-salt metabolism, as well as activation of inflammatory and immune reactions. Mineralocorticoids stimulate the reabsorption of sodium by the kidneys, which leads to water retention in the body and an increase in blood pressure; - production of glucocorticoids (cortisol, hydrocortisone, etc.). These hormones carry out blood glucose levels by synthesizing them from the breakdown products of fats and proteins. Hormones suppress inflammation and immune reactions, which are used in medicine to treat autoimmune, allergic reactions, etc.; - the production of sex hormones, mainly androgens (dehydroepiandrosterone and androstenedione), they have a weak androgenic effect, but stimulate muscle growth when released under stress. The production and secretion of androgens is stimulated by the adrenocorticotropic hormone; - Produces catecholamines-the hormone adrenaline and the neurotransmitter norepinephrine-that are produced under stress in the cornea. The adrenal glands are paired parenchymatous organs of a zonal type. Externally it is covered with a dense, unformed capsule of connective tissue, from which layers spread deeper into the organ - the trabecula. The capsule contains smooth myocytes, vegetative ganglia, accumulation of fat cells, nerves and blood vessels. The capsule and layers of loose connective tissue form the stroma of the organ. The adrenal glands are paired parenchymatous organs of a zonal type. Externally it is covered with a dense, unformed capsule of connective tissue, from which layers spread deeper into the organ - the trabecula. The capsule contains smooth myocytes, vegetative ganglia, accumulation of fat cells, nerves and blood vessels. The capsule and layers of loose connective tissue form the stroma of the organ. Parenchyma is represented by a set of cells: corticocytes in the cortex and chromafinocytes in the medulla. The adrenal glands are clearly separated into two zones that are structurally and functionally different from each other: The bark part consists of three zones: • The Glomerulosa zone accounts for 10% of the adrenal cortex. It is formed by small corticocytes that form the glomerulus. They have a moderately developed smooth endoplasmic reticulum - the site of the synthesis of corticosteroid hormones. The functions of the Glomerulosa zone are the production of mineralocorticoids; • zona fasciculata is the most prominent zone of the bark of the adrenal glands. The Glomerulosa zone accounts for 10% of the adrenal cortex. It is formed by small corticocytes that form the glomerulus. They have a moderately developed smooth endoplasmic reticulum - the site of the synthesis of corticosteroid hormones. The functions of the Glomerulosa zone are the production of mineralocorticoids; • zona fasciculata is the most prominent zone of the bark of the adrenal glands. It is formed by large oxyphilic corticocytes, forming cords and bundles. In thin layers of loose connective tissue, sinusoidal capillaries lie between the bundles. There are two types of tufted corticocytes: blunt and light. It is a type of cell that is in a different functional state. The function of the Fasciculata zone is to produce glucorticoids (mainly cortisol and cortisone).n thin layers of loose connective tissue, sinusoidal capillaries lie between the bundles. There are two types of tufted corticocytes: blunt and light. It is a type of cell that is in a different functional state. The function of the Fasciculata zone is to produce glucorticoids (mainly cortisol and cortisone). Characteristics of the species: in guinea pigs, gerbils, snakeflies, cortisol is the main hormone; in dogs, monkeys, sheep and pigs-cortisol and corticosterone; in rats, mice, birds, reptiles, and amphibians - only corticosterone. • The reticular zone occupies about 10-15% of the entire trunk (cortex). It consists of small cells that lie

in the form of a network. In the reticular zone, glucorticoids and male sex hormones are formed, in particular, androstenedione and dehydroepiandrosterone, as well as a small amount of female sex hormones (estrogens and progesterone). The reticular zone occupies about 10-15% of the entire trunk (cortex). It consists of small cells that lie in the form of a network. In the reticular zone, glucorticoids and male sex hormones are formed, in particular, androstenedione and dehydroepiandrosterone, as well as a small amount of female sex hormones (estrogens and progesterone). Androgens of the Adrenal cortex have a weak androgenic effect, unlike androgens of the gonads, but their anabolic effect on skeletal muscle is retained, which has significant adaptive significance. Hormones of the cortex of the adrenal glands are fat-soluble substances that easily penetrate the cell membrane, so there are no secretory granules in corticocytes.

According to scientific research by foreign scientists, the medulla is located immediately under the zona reticularis of the bark, which in some animal species is characterized by a thin capsule of connective tissue loose from the bark. It is formed by the accumulation of chromafinocyte cells, which are well stained with chromium salts. These cells are divided into two typesAccording to scientific research by foreign scientists, the medulla is located immediately under the zona reticularis of the bark, which in some animal species is characterized by a thin capsule of connective tissue loose from the bark. It is formed by the accumulation of chromafinocyte cells, which are well stained with chromium salts. These cells are divided into two types: • large light cells (a-cells), which produce the hormone adrenaline, store granules of moderate electron density in their cytoplasm; • dark small chromaffinocytes (H-cells), which contain a large number of dense granules, they produce norepinephrine. Vegetative neurons (ganglion cells) and support cells, a type of neuroglia, are also located in the medulla. They surround chromaffinocytes with their processes. dark small chromaffinocytes (H-cells), which contain a large number of dense granules, they produce norepinephrine. Vegetative neurons (ganglion cells) and support cells, a type of neuroglia, are also located in the medulla. They surround chromaffinocytes with their processes. Blood supply to the adrenal glands: arteries entering the capsule break into arterioles, forming a dense subcapsular network, and capillaries of the fenestrated and sinusoidal type that supply blood to the cortex. From the reticular zone, capillaries penetrate into the medulla, which develop into broad sinusoids and merge into venules. The venules become veins and form the venous tangle of the medulla. Arterioles from the subcapsular network also enter the medulla and decompose into capillaries. Lencher O. Lencher O.S. according to scientific research of (2016) the adrenal glands are specific heterogeneous organs that, in addition to being actively involved in adapting to non-specific stress, participate in the exchange of minerals, the regulation of the immune response, the plastic exchange of the body, etc. Ilyasov A. Ilyasov A.S. and Ilyasov A.S. and Umarkulova G.A.from the research of Lar (2024), it is known that the adrenal glands are involved in many metabolic processes in the body, provide regulatory connections and are actively involved in reactions that occur when the body's homeostasis is disrupted. In stressful situations (adaptation to new environmental conditions, radiation, physical inactivity, hypovitaminosis, infectious diseases), a reaction of the cortex zones of the adrenal gland is observed, which is manifested in an unequal relationship between glucocorticoid, mineralocorticoid and androgenic functions. Donchenko S. D Donchenko Donchenko S. V., Bilash S. M. according to (2022) the adrenal glands are covered with a capsule of connective tissue, under which is a layer of poorly stratified cells. The cortex consists of a system of epithelial filaments. Between them, blood vessels pass through the layers of connective tissue. The glomerular or outer zone is located under the capsule. Cortical endocrinocytes (adrenocorticocytes) form arcades or tangles. In the cytoplasm of these cells, the agranular endoplasmic reticulum is well developed, which is usually characteristic of cells that synthesize steroid hormones. The glomerular or outer zone is located under the capsule. Cortical endocrinocytes (adrenocorticocytes) form arcades or tangles. In the cytoplasm of these cells, the agranular endoplasmic reticulum is well developed, which is usually characteristic of cells that synthesize steroid hormones. The fasciculata zone of the adrenal glands consists of light cubic or prismatic endocrinocytes, forming cords or bundles oriented perpendicular to the surface of the adrenal gland. The zonal reticularis of the bark of the adrenal glands consists of endocrinocytes that form a loose network. Here, the endocrinocytes are smaller than in the fascicular zone. Ostonova G. Ostonova

G.R. according to N (2024), hormones play an important role in the humoral control of the body. These substances are produced in the glands of internal secretion, also called endocrine glands. Usually, endocrine glands are understood as glands that synthesize special physiologically active substances - hormones and release them directly into the internal environment of the body - blood and tissue fluid. Hormones are produced in the cells of the endocrine glands, enter the blood directly through the vessels that supply the gland, spread throughout the body and strengthen or weaken the activity of various organs. Adrenal cortex cells are genetically close to epithelial cells. They form three areas: the outer ballpark area, the middle tutam area, and the Inner Net area. Mineralocorticoids are synthesized in the glomerular area, the most active of which is aldosterone.ormones are produced in the cells of the endocrine glands, enter the blood directly through the vessels that supply the gland, spread throughout the body and strengthen or weaken the activity of various organs. Adrenal cortex cells are genetically close to epithelial cells. They form three areas: the outer ballpark area, the middle tutam area, and the Inner Net area. Mineralocorticoids are synthesized in the glomerular area, the most active of which is aldosterone. Glucocorticoids are synthesized in the ball area. In the reticular area, a small amount of sex hormones is synthesized. The Adrenal medulla synthesizes adrenaline and non-adrenal hormones. Hormone secretion consists of 80% adrenaline and 20% norepinephrine. During histological studies, Fedotov D. DDuring histology During histological studies, Fedotov D.N. and Kuchinsky M.P. (2022) studied the adrenal glands and found that cortical cells are sparsely mottled, with slight granularity of cytoplasmic color and basophilic displacemenDuring histological studies, Fedotov D.N. and Kuchinsky M.P. (2022) studied the adrenal glands and found that cortical cells are sparsely mottled, with slight granularity of cytoplasmic color and basophilic displacement.

The above morphological signs indicate the constant large release of cortical hormones into the blood, and their reserves in the cells do not have time to replenish. In this regard, partial delipoidization of the cortex of the adrenal glands occurs, the cytoplasm of all cells is slightly basophilic with some granularity, and foci of cell cytolysis (especially the glomerulosa zone) appear. The glomerulosa zone of the bark of the adrenal gland of rats consists of vertically located strands of adrenocorticocytes of various shapes, often stretched horizontally. In the cells of the glomerulose zone of the bark of the adrenal glands, the nuclei are oval or irregularly rounded, have a low chromatin, central and sometimes eccentric position.he glomerulosa zone of the bark of the adrenal gland of rats consists of vertically located strands of adrenocorticocytes of various shapes, often stretched horizontally. In the cells of the glomerulose zone of the bark of the adrenal glands, the nuclei are oval or irregularly rounded, have a low chromatin, central and sometimes eccentric position. Chromatin in the nucleus is represented by powdery granularity, and tiny nuclei - one, rarely two-are poorly visible. Belik I. B Belik I.A.according to the medulla of the adrenal glands are represented by densely located complexes made up of large, round or polygonal secretion cells. Cell complexes are bounded by sinusoids - blood vessels. The bark of the adrenal glands consists of three histological zones: glomerular, fascicular and reticular, differing in the arrangement of secretory cells relative to k I.A.according to the medulla of the adrenal glands are represented by densely located complexes made up of large, round or polygonal secretion cells. Cell complexes are bounded by sinusoids - blood vessels. The bark of the adrenal glands consists of three histological zones: glomerular, fascicular and reticular, differing in the arrangement of secretory cells relative to each other. The latter is combined in a system of numerous closely spaced epithelial threads oriented perpendicular to the capsule. The Glomerulosa zone is located under the connective tissue capsule. It is built from cells collected in spherical clusters, each of which contains 5-10 adrenocorticocytes with an elongated shape. A transition zone is observed between the Glomerulosa zone and the fasciculata zone consisting of cells that are relatively densely packed together.The Glomerulosa zone is located under the connective tissue capsule. It is built from cells collected in spherical clusters, each of which contains 5-10 adrenocorticocytes with an elongated shape. A transition zone is observed between the Glomerulosa zone and the fasciculata zone consisting of cells that are relatively densely packed together. The middle, fascicular zone, the widest, is represented by large cells, prismatic and polygonal in shape, forming cords of narrow radius, 1-2 cells thick. The threads are separated from each other by fibrous connective tissue with sparse capillary sinusoids. The deepest Zone of the cortex is reticular, consisting of compactly located cells that form mutually

anastomosing cords and isolated groups. The latter are characterized by a large number of sinusoidal blood capillaries. The cells in this zone are smaller in size than in the fascicular zone. Volkov V. Volkov V.P. according to (2014) the adrenal glands are the most important endocrine glands in rats. They participate in the neurohumoral regulation of water-salt, protein, fat and carbohydrate metabolism and control the body's adaptation processes. The adrenal glands have relative lability and are capable of rapid morphofunctio.

It was found that the connective tissue capsule of the adrenal gland usually has uneven relief, thinned and significantly collagenated in places. The capsule of the left adrenal gland is 1.4 times thicker than the right. In the lower layers of the adrenal parenchyma, the trabeculae that emerge from the capsule form the connective tissue frame of the organ. Arteries and veins are visible in the capsule, and threads of epithelial cells in the trabeculae and glomeruli include veins of the hemocrosirculation bed: arterioles, precapillaries, capillaries, postcapillary, collecting and muscle venules. There is one poorly stratified subcapsular cell under the capsule. In the right adrenal gland, the thickness of the glomerulosa zone is 1.22 times less than in the left.rteries and veins are visible in the capsule, and threads of epithelial cells in the trabeculae and glomeruli include veins of the hemocrosirculation bed: arterioles, precapillaries, capillaries, postcapillary, collecting and muscle venules. There is one poorly stratified subcapsular cell under the capsule. In the right adrenal gland, the thickness of the glomerulosa zone is 1.22 times less than in the left. Cortical endocrinocytes (corticocytes) of the glomerulose zone form arcades or glomeruli of polygonal shape. In this zone, the main number of endocrinocytes with pronounced vacuolization and fine tanninity of the cytoplasm. The nuclei are weakly basophilic and are dominated by euxromatin, round or slightly oval in shape. The walls of blood vessels and perivascular regions are unchanged.n this zone, the main number of endocrinocytes with pronounced vacuolization and fine tanninity of the cytoplasm. The nuclei are weakly basophilic and are dominated by euxromatin, round or slightly oval in shape. The walls of blood vessels and perivascular regions are unchanged. In the right adrenal gland, the diameter of the anterior and postcapillaries is 1.13 and 1.27 times larger than in the left, and on the contrary, the capillaries on the right are 1.13 times larger than on the left. As the epithelial threads spread to the center of the adrenal gland, their orderliness disappears, and the fascicular zone without particularly clear boundaries becomes a loose mesh zone. The endocrinocytes of the reticular zone are small (2-3 μm), irregular in shape, round, with distinct basophilic nuclei and vacuolated cytoplasm such as cells of the glomerulose zone.s the epithelial threads spread to the center of the adrenal gland, their orderliness disappears, and the fascicular zone without particularly clear boundaries becomes a loose mesh zone. The endocrinocytes of the reticular zone are small (2-3 μm), irregular in shape, round, with distinct basophilic nuclei and vacuolated cytoplasm such as cells of the glomerulose zone. In some places, groups of brain endocrinocytes (adrenalocytes) are found here. The diameter of the hemocapillaries increases as they approach the medulla (15.3±0.5 μm).

Conclusion. The morphology of the adrenal glands is the subject of much scientific work carried out on histological and experimental materials in both young and various pathologies. At the same time, the dynamics of changes in the histoarchitecture of the adrenal glands in terms of ontogenesis has not been sufficiently studied, and the available data is not always clear. Conclusion. The morphology of the adrenal glands is the subject of much scientific work carried out on histological and experimental materials in both young and various pathologies. At the same time, the dynamics of changes in the histoarchitecture of the adrenal glands in terms of ontogenesis has not been sufficiently studied, and the available data is not always clear. Thus, some literary sources emphasize the stability of the structure of the tissues of the adrenal glands throughout a person's life. In others, age-related atrophy of the cortex has been reported, mainly due to the glomerular and reticular zones.

LITERATURE USED

1. Абдуазизова Н. Х. и др. Постковидный синдром и ревматоидный артрит. – 2024.
2. Балабанова Р. М. Современная стратегия и безопасность применения нестероидных противовоспалительных препаратов при ревматических заболеваниях //Лечащий врач. Ревматология. – 2012. – Т. 5. – С. 20-26.
3. Гордеев А. В. и др. Существует ли «почечно-легочный синдром» при ревматоидном артрите? //Современная ревматология. – 2024. – Т. 18. – №. 2. – С. 51–55.
4. Девальд И. В. и др. Поиск предикторов токсичности метотрексата при ревматоидном артрите //Клиницист. – 2024. – Т. 17. – №. 3. – С. 22-30.
5. Жамолов А. Ш., Касимова М. Б. Анемия при ревматоидном артрите : дис. – Санкт-Петербург, 2023.
6. Заяева А. А. и др. Аутоиммунный/воспалительный синдром, индуцированный адъювантами //Архивъ внутренней медицины. – 2024. – Т. 13. – №. 6. – С. 405-412.
7. Ильясов, А.С. и Умаркулова, Г.А. 2024. Морфофункциональное состояние клеточных структур надпочечников при моделировании тиреотоксикоза крыс самок. *Журнал гуманитарных и естественных наук*. 1, 7 (фев. 2024), 72–76.
8. Кадирова Л. В. Морфологические Параметры Надпочечников При Различных Воздействиях //AMALIY VA TIBBIYOT FANLARI ILMIY JURNALI. – 2023. – Т. 2. – №. 5. – С. 182-187.
9. Лялина Вера Валерьевна, Борисовская С.В., Скрипниченко Э.А., Эттингер О.А., Паджева Т.М., Никитин И.Г. Периоперационное ведение пациентов с ревматологическими заболеваниями: рекомендации по применению глюкокортикостероидов, болезнь-модифицирующих антиревматических препаратов, генно-инженерных биологических препаратов, нестероидных противовоспалительных препаратов // Архивъ внутренней медицины. 2022. №1 (63). С.22-34
10. Малыхин А. С., Мерзленко Р. А. Сравнительная оценка функционального состояния щитовидной железы и коры надпочечников у кошек разных возрастов //Международный вестник ветеринарии. – 2023. – №. 2. – С. 236-241.
11. Медведева Е. В. и др. Морфофункциональная характеристика надпочечников и печени крыс Wistar в состоянии однокомпонентного стресса и при его коррекции этилметилгидроксипирида сукцинатом: выпускная бакалаврская работа по направлению подготовки: 06.03. 01-Биология. – 2023.
12. Набиева Б. Ш. РОЛЬ РЕВМАТОЛОГИЧЕСКИХ ЗАБОЛЕВАНИЙ В РАЗВИТИИ ХРОНИЧЕСКОЙ БОЛЕЗНИ ПОЧЕК (литературный обзор) //ББК 54.11 А-380. – 2024. – С. 197.
13. Осипова И. В., Стародубова Ю. Н. Прогнозирование сердечно-сосудистых заболеваний у женщин с ревматоидным артритом //Кардиология. – 2024. – Т. 64. – №. 1. – С. 67-79.
14. Поздняков Д. И. и др. Противовоспалительные и антирезорбтивные эффекты ацилзамещенных производных хромона в условиях экспериментального ревматоидного артрита //Фармация и фармакология. – 2024. – Т. 11. – №. 5. – С. 422-431.
15. Соболева Е. М. Эпифизарно-гипофизарно-надпочечниковая регуляция у больных ювенильным ревматоидным артритом //Таврический медико-биологический вестник. – 2013. – №. 16, № 3 (1). – С. 148-153.
16. Ураков Ж. Р. СВЯЗЬ РЕВМАТОИДНОГО АРТРИТА С ЗАБОЛЕВАНИЯМИ ЩИТОВИДНОЙ ЖЕЛЕЗЫ //O'ZBEKISTONDA FANLARARO INNOVATSIYALAR VA ILMIY TADQIQOTLAR JURNALI. – 2023. – Т. 2. – №. 19. – С. 1238-1242.

17. Шишмарева А. М., Фатыхова А. Р. СТРОЕНИЕ, ФУНКЦИИ И ЗАБОЛЕВАНИЯ НАДПОЧЕЧНИКОВ У ЖИВОТНЫХ //Современные научные тенденции в ветеринарии. – 2023. – С. 135-138.