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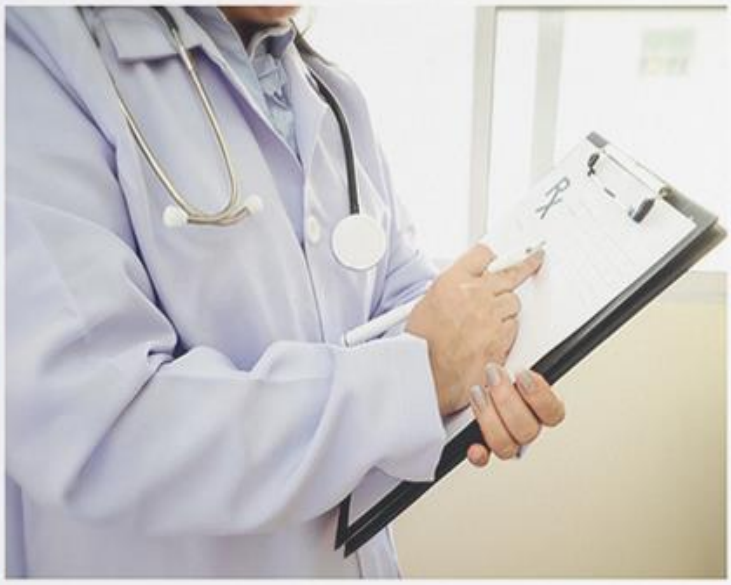

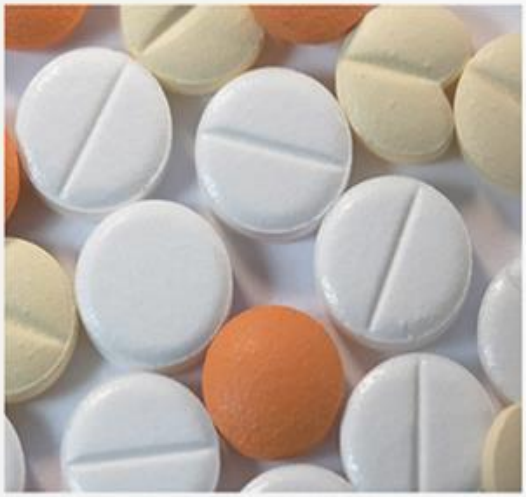

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Morphological Indicators of the Spleen of Healthy Rats and its Lymphoid Structures

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Annotation: the spleen generates a generalized immune response to antigen, inflammatory process and various pathogenic factors, which ensures the necessary level of the body's immune homeostasis, as well as flexibility.

Key words: spleen, inflammation, morphologic and morphometric indicator.

Relevance of the study: the spleen is located between the bottom of the stomach and the diaphragm in the left hypochondria region of the abdomen. In humans, it is about 12 cm long, 7 cm wide and 3 cm thick and weighs around 150-250 G.the spleen artery, spleen vein, efferent lymph vessels and spleen nerve plexus pass through the hilus, a depressed area in the capsule [1, 2, 3].

In humans, the spleen is formed from the dorsal intestinal tract at 5-6 weeks of embryonic development. At first, the spleen will consist of the sum of primary blood vessels and mesenchymal cells. Later, part of the cells is stratified into reticular tissue, which is made up of cells.

At the time of birth, the histogenesis of the spleen will be incomplete. Trabeculae and capsule composed of reticular cells are loose, the number of primary lymphatic nodules is low, while secondary nodules do not exist [Steiniger B.S., 2015].

The specific gravity of spleen white pulp in newborns is on average 1/7 of the size of the member. In infancy, it will be possible to distinguish between periarterial lymphoid couplings and lymphatic nodules in the white pulp. Lymphoid nodules are unevenly distributed in different parts of the organ. They are more abundant in the peripheral part of the spleen, and in small numbers in the central part, where periarterial lymphatic couplings are abundant.

Neonatal spleen lymphatic nodules do not have reproductive centers. They are formed by the end of the 1st year. Then the amount of lymphatic nodules increases and reaches its maximum at 10 years of age.

in postnatal ontogenesis, a decrease in the overall immune function of the spleen is associated with a decrease in the humoral type, i.e., V-cell immune response, from multiple gixat. In addition, it is of particular importance that the spleen weakens the cellular immune response associated with the reduction of T-lymphocytes. In general, the decrease in the immune activity of the spleen depends on the state of V - and T-cell immunity and age-related observed scleratic processes.

The spleen is an organ that not only effectively uses its own immune cells, but also mobilizes the body's immune cells to monitor immunity and protect other important organs, including the heart, kidneys and brain[4, 5, 6, 7]. Cells that play an important role in spleen functions are macrophages, monocytes, natural killer (TK) cells, and B - and T cells. The spleen is susceptible to physical injury, infections, and various immunological conditions, including cancer. Spleen enlargement or splenomegaly can be caused by anemia, infections, inflammation, cancer, metabolic disorders, and

liver disease. The spleen has four important structures, namely, the capsule, the red pulp (KP), the white pulp (op), and the marginal zone (MZ) each region shows a distinct morphological structure and participates in specific physiological functions. The capsule contains sympathetic nerve fibers consisting of dense connective tissue, elastic and smooth muscle fibers, and the spleen nerve plexus. KP contains many sinuses filled with platelet-rich blood. Spongy cellular cords (Billrot cords) composed of reticular fibers and reticular cells mixed with a number of immune cells, such as macrophages, monocytes, granulocytes, B cells, T cells, and plasma cells, have been found among the sinuses. In the spleen, several KP function to produce specific functions, including blood filtration, antigenic stimulation, and proliferation of B and T cells, and antibodies with different properties. KP accounts for about 70% of the spleen volume in adults. Op is a bulib consisting of a periarterial lymph shell (Palm) that contains a lymphocyte-rich area, around which the arterial vessels are especially around the central artery and the central arterioles, follicles and loose lymphatic tissue are blurred. Palm is the shell of mainly SD4+ and T-cell lymphocytes that envelop the central arterial vessels. Follicles contain not only B - cells, but also T-cells located next to the Palm. Between important immunological activity and cell destruction and different immune cells, cross-Aloca occurs. The marginal zone (MZ) bordering the Palm and follicles has few lymphocytes, but consists of many macrophages and antigen-producing cells (Aich). B cells immunological activation go to Mz as a result of antigenic meeting [9]. Many lymphocytes in MZ migrate to the corresponding t - and B areas. MZ contains the highest concentration of blood antigens than other areas in the spleen, as arterial blood in the spleen is released into MZ. Marginal Zone B cells show somatic hypermutation, clonal expansion [10], and positive selection of B cells [11]. B-cell clonal expansion also occurs in the germinal center of the B-cell follicle after antigenic stimulation.

The spleen generates a generalized immune response to antigen, inflammatory process and various pathogenic factors, which ensures the necessary level of the body's immune homeostasis, as well as flexibility.

When blood flow in the body is disrupted, the spleen enlarges and, according to some researchers, can act as a depot and accumulate a large amount of blood. Due to its contraction, the spleen releases the blood collected in it into the vascular stream, as a result of which its volume becomes smaller, the amount of erythrocytes in the blood increases.

In chronic immune inflammation, proliferative processes occur in the white pulp of the spleen. The volume of white pulp, the density of cell elements in lymphatic nodules and periarterial lymphatic mucosa increases. Apoptosis and macrophagal reaction are enhanced in spleen lymphoid structures.

The purpose of the study: to study the normative morphological and morphometric indicators of the White Rat spleen in postnatal ontogenesis.

Material and methods: for striking morphological and morphometric indicators in the talok, an experiment was carried out on 10 newborn, 3, 6, 9, 12-month-old OK randomized rats in the stationary conditions of the vivarium of the Bukhara State Medical Institute. All animal experiments are carried out in accordance with the international principles of the European Convention for the protection of vertebrates, which is used for experimental and other scientific purposes, as well as in accordance with the "rules for performing work using experimental animals".

The object of research will be histological material from various parts of the spleen of experimental animals. The study used techniques such as staining of micro-preparations with hematoxylin-eosin, staining of micro-preparations according to Van Gizon, general blood test, method of variational statistics using Strelkov tables.

Results: the study found that the weight of newborns ranged from 4.2 g to 5.6 G, with an average of 5.16±0.14 g. The absolute weight of the spleen is 0.02 - 0.03 g, with an average of 0.032±0.002 g. The weight index ranged from 0.535% to 0.684% with an average of 0.607±0.02%.

The newborn white squid spleen was 5.2 mm to 8.3 mm long and averaged 7.2±0.22 mm. The width of the spleen is 1.4-2.7 mm, and on average - 2.2±0.16 mm. The width of the spleen was from 0.8 mm to 1.5 mm, and on average - 1.2±0.11 mm.

The relative area of the white pulp was 14.5 to 20.1%, with an average of -17.26±0.64%. The relative area of connective tissue elements is 5.2% - 6.6%, with an average of 5.74±0.16% (relative to the total area of the spleen incision).

The Palm was 91.2 µm to 107.2 µm in diameter, averaging - 101.2±2.05 µm. The Lt is 216.4 - 252.2 µm in diameter, with an average of -232.76±3.65 µm. In a third of the total number of lymphatic nodules, it is possible to identify the areas of the mantle and Border.

The width of the mantle area ranged from 26.4 µm to 38.3 µm, with an average of -36.28±1.07 µm. The boundary area is 56.3 - 69.7 µm wide with an average of 65.32±1.45 µm. The width of the Periarterial area ranged from 38.6 µm to 46.4 µm, with an average of -43.16±1.06 µm.

The white pulp of the spleen of newborn white rats is made up of lymphocytes of different stages of maturation.

The White bat spleen is fully formed during the three-month period. When the spleen of healthy rats in the 3-month period was studied, the following data were obtained:

Animal body weight in the 3-month period ranged from 90 g to 130 g, averaging - 104.16±3.68 g. The absolute weight of the spleen is 0.3 - 0.7 g, with an average of - 0.42±0.037 g. The weight index ranged from 0.333% to 0.551% with an average of 0.45±0.02%. When compared to newborn white bats, the animal weight increased by 22.04 times and the member's absolute weight increased by 14.25 times.

The length of the spleen was from 21.4 to 29.2 mm, and on average - 24.78±0.63 mm. The growth rate is about 262.0% compared to newborn white rats. The width of the spleen was 4.6-6.4 mm, and on average - 5.84±0.26 mm. The growth rate is -177.2% compared to newborn white bats. The thickness of the spleen was from 1.8 mm to 3.9 mm, and on average - 2.82±0.19 mm. The growth rate is about 133.3% compared to newborn white rats.

In the histological preparations of Healthy White Rats of 3 months of age, it was observed that the red and white pulp of the member parenchyma is clearly separated from each other.

The white pulp had a relative area of 18.8% to 26.2%, averaging - 22.2±0.59% (figure 3.1.3). When compared to newborn white bats, the relative area of the white pulp increased by 28.4%. The relative area of connective tissue elements was from 5.0% to 6.1%, and on average – 5.42±0.1% (compared to the total area of the spleen incision)

In the white pulp of the spleen, it is possible to clearly distinguish between periarterial lymphatic couplings and lymphatic nodules. The Palm was 112.6 µm to 139.6 µm in diameter, averaging - 132.14±1.56 µm. The growth rate is about 30.9% compared to newborn white rats. Lymphatic nodules increased in diameter by 92% when compared to newborn rats, and ranged from 341.8 µm to 476.05 µm, averaging - 456.05±13.27 µm. The prosent ratio of primary and secondary LTS is 32% -68% respectively. Reproductive centers formed in secondary LTS have been identified. The Km lari ranged in diameter from 92.6 µm to 167.8 µm, averaging - 147.8±6.73 µm. Lt is large and some have merged with each other. Spleen lymphatic nodules are mostly circular, oval, and oblong in shape.

In most cases, functional areas are clearly differentiated in LTS. The width of the mantle sphere ranged from 37.7 µm to 49.45 µm, with an average of - 45.32±0.89 µm. The boundary area is 70.3 µm - 84.7 µm wide with an average of -75.14±1.32 µm. The width of the Periarterial area ranged from 81.9 µm to 89.4 µm, with an average of 85.04±0.69 µm. The width of the mantle, border and periarterial areas increased by 28.45%, 20% and 90.6% respectively when compared to newborn bats.

The study found that the total number of lymphocytes in LTS without a breeding centre was 42-53 with an average of 45.3±1.01 cells.

The White bats of the 6-month period weighed between 188 g and 240 g, averaging - 221.2±5.4 g. The absolute weight of the spleen is 0.6 - 0.9 g, with an average of - 0.89±0.032 g. The weight

index ranged from 0.315% to 0.405% with a mean of 0.348±0.01%. Compared to rats in the 3-month period, rats increased their body weight by 1.95 times and the member's absolute weight by 1.52 times.

The length of the spleen was from 24.4 mm to 35.7 mm, and on average - 31.76±1.0 mm. The growth rate is about 18.6% compared to three - month-old white rats. The width of the spleen was 4.9-7.8 mm, and on average - 6.34±0.03 mm. The growth rate is about 6.73% compared to three - month-old white rats. The thickness of the spleen was from 2.4 mm to 4.4 mm, and on average - 3.12±0.19 mm. The growth rate is about 6.86% compared to three - month-old white rats.

In white bats of the control group at 6 months of age, the relative area of the spleen white pulp ranged from 16.2 to 24.6% with an average of -20.54±0.69%. When compared to white bats of the 3-month period, the relative area of the white pulp decreased by 8.1%. Connective tissue elements had a relative area of 5.6% to 6.8%, and averaged - 6.21±0.12% (relative to the total area of the spleen incision).

The Palm was 118.2 μm to 141.6 μm in diameter, averaging - 126.22±1.55 μm. The growth rate is about 3.1% compared to three - month-old white rats. Lymphatic nodules ranged in diameter from 380.8 to 477.05 μm, averaging - 410.96±10.44 μm. The prosent ratio of primary and secondary LTS is 34% -66% respectively. Breeding centres ranged in diameter from 132.4 μm to 147.7 μm, averaging - 135.08±2.53 μm. The diameter of the LTS and kmes decreased by 9.7% and 9.42% respectively when compared to the White bats of the 3-month period. LTS have a circular, oval and oblong shape.

The width of the spleen lt lari mantle domain ranged from 40.5 μm to 50.4 μm, averaging 44.56±1.06 μm. The boundary area is 75.5 - 86.2 μm wide with an average of 80.72±1.26 μm. The width of the Periarterial area ranged from 84.9 μm to 94.7 μm, with an average of 89.42±1.06 μm. The extent of the mantle, boundary, and periarterial areas increased by 2.74%, 4.64%, and 5.15% respectively when compared to the White bats of the 3-month period.

The study found that the total number of lymphocytes in LTS without a breeding centre was 53-61 with an average of 57.2±0.97 cells. The total number of lymphocytes in LTS that do not have a breeding center increased by 21.0% when compared to white bats in the 3-month period.

The total number of lymphocytes in Periarterial lymphatic Mufta was 56-61 with an average of 58.4 ±0.76 cells. The total number of lymphocytes in Periarterial lymphatic mufts increased by 22.7% when compared to white rats in the 3-month period.

The weight of laboratory animals in the 9 - month period was from 220 g to 280 g, and on average-246.33±5.52 g. The absolute weight of the spleen is 0.7 - 1.0 g, and the average is 0.78±0.028 g. The weight index ranged from 0.302% to 0.370% with an average of 0.317±0.01%. Compared to white bats in the 6-month period, the animal weight increased by 1.16 times and the member's absolute weight increased by 1.06 times.

The length of the spleen was from 30.3 mm to 37.4 mm, and on average - 34.21±0.74 mm. The growth rate is about 7.7% compared to six - month-old white rats. The width of the spleen was 5.1 - 7.8 mm, and on average - 6.52±0.26 mm. The growth rate is about 2.84% compared to six - month-old white rats. The spleen was 2.5 mm to 4.4 mm thick and averaged 3.21±0.17 mm. The growth rate is about 2.8% compared to six - month-old white rats.

In healthy white bats of 9 months, the relative area of white pulp ranged from 18.1% to 22.4% with an average of 20.14±0.42%. When compared to white bats of the 6-month period, the relative area of the white pulp decreased by 2.2%. The relative area of connective tissue elements is 5.7% - 6.6%, and the average is 6.23±0.1% (relative to the total area of the spleen incision).

The Palm was 133.2 μm to 142.3 μm in diameter, averaging - 136.72±0.93 μm. The growth rate is about 1.1% compared to six - month-old white rats. Lymphatic nodules ranged in diameter from 378.7 μm to 447.3 μm, averaging - 413.84±6.31 μm. The prosent ratio of primary and secondary LTS is 35% -65% respectively. Breeding centres ranged in diameter from 114.4 μm to 142.8 μm,

averaging - 117.62±2.52 µm. The diameter of the Lt and kmes, compared to the White bats of the 6-month period, decreased by 1.47% and 5.85% respectively. LTS have a circular, oval and oblong shape.

Spleen lt lari ranged in mantle area width from 38.4 µm to 49.9 µm, averaging - 44.77±1.06 µm. The boundary area is 70.1 -82.4 µm wide with an average of 77.34±1.13 µm. The width of the Periarterial area ranged from 78.7 µm to 92.8 µm, averaging - 84.97±1.29 µm (figure 3.1.7). The width of the mantle, border and periarterial areas decreased by 4.0%, 5.74% and 5.24% respectively when compared to white bats of the 6-month period.

The study found that the total number of lymphocytes in LTS without a breeding centre was 49-56 with an average of 52.2±0.74 cells. When compared to white rats in the 6-month period, the total number of lymphocytes in LTS decreased by 9.6%.

The total number of lymphocytes in Periarterial lymphatic Mufta was 56-65 with an average of 61.3±0.83 cells. When compared to white bats in the 6-month period, the total number of lymphocytes in Palm increased by 3.2%.

White bats from the 12-month period in the control group weighed between 260 and 320 g, with an average of 282.44±6.48 g. The member has an absolute weight of 0.8 - 1.1 g, with an average of 0.88±0.03 g. The weight index ranged from 0.288% to 0.354% with an average of 0.325±0.01%. Compared to the White bats of the 9-month period, animals increased their weight by 1.1 times, and the member's absolute weight by 1.1 times.

The length of the spleen was from 34.4 mm to 43.7 mm, and on average - 36.57±0.89 mm. The spleen is 5.3-8.2 mm wide with an average of 6.56±0.31 mm. The thickness of the spleen was from 2.7 mm to 4.5 mm, and on average - 3.23 ±0.20 mm. The linear dimensions of the spleen: length, width and thickness increased by 6.7%, 0.61% and 0.62%, respectively, when compared with white bats of the nine-month period.

In healthy white bats of the 12-month period, the relative area of white pulp ranged from 16.2% to 21.8% with an average of -18.44±0.49%. When compared to white bats of the 9-month period, the relative area of the white pulp decreased by 8.64%. Connective tissue elements have a relative area of 5.8% -6.8%, with an average of 6.38±0.11% (relative to the total area of the spleen incision).

The Palm was 131.4 to 141.8 µm in diameter, averaging - 136.56±1.23 µm. Lymphatic nodules ranged in diameter from 370.7 µm to 437.3 µm, averaging - 408.98±7.19 µm. The prosent ratio of primary and secondary LTS is 49% -50% respectively. It is difficult to distinguish between their Km. The diameter of the breeding centres ranged from 110.2 µm to 132.7 µm, averaging 120.12±2.43 µm. The diameters of Palm, lt, and kms decreased by 0.85%, 1.68%, and 6.23% in mos Hol when compared to nine-month-old white bats. White pulp LTS have an oval and oblong shape.

The width of the spleen lt lari mantle area ranged from 35.4 µm to 47.7 µm, with an average of - 41.32±1.12 µm. The width of the boundary sphere is 68.4 - 76.7 µm, with an average of - 72.42±0.89 µm. The width of the Periarterial area ranged from 74.8 µm to 84.7 µm, with an average of - 79.98±1.06 µm (figure 3.1.8). The extent of the mantle, border and periarterial areas decreased by 8.32%, 5.27% to 6.24%, respectively, when compared to the White bats of the 9-month period.

The study found that the total number of lymphocytes in LTS without a breeding center was 47-53 with an average of 50.3±0.65 cells. When compared to white rats in the 9-month period, the total number of lymphocytes in LTS decreased by 3.6%.

The total number of lymphocytes in Periarterial lymphatic Mufta was 53-61, with an average of 55.8 ±0.86 cells. When compared to white bats in the 9-month period, the total number of lymphocytes in Palm decreased by 4.2%.

Analysis of the results of the study showed that the highest growth rate of body and limb absolute weight of newborn white bats occurred in the 3 - month period, occurring respectively - 22.14 and

16.24 times, while the minimum occurred in the 12-month period, increasing correspondingly-1.1 i 1.15 times.

The growth rate of spleen length, width and thickness was highest in the 3-month period, at 262.0%, 180.2% and 143.3% in mos Hol, and lowest in the 12-month period, at 6.79%, 0.61% and 0.62% respectively.

In newborn white bats, the relative area of spleen white pulp was 17.16±0.64%, increasing in later ages and decreasing after a peak period of 6 months of 22.2±0.49%, 6 months of age, and having a value of 18.54±0.98% over a 12-month period.

The relative area of connective tissue elements is 5.84±0.14% in neonatal White bats, with this indicator found to be relatively low (5.42±0.1%) in animals at 3 months, and high (6.48±0.1%) at 12 months.

Palm diameter was 101.2±2.05 μm in newborn white bats, with the highest value of this indicator observed in the 9-month period (138.72±0.93 μm). The 12-month period decreased to 136.56±1.23 μm.

The LTS increased in diameter by 1.92 times over a 3-month period and were 467.05±13.27 μm. Gradually decreasing after the 3-month period, it reached a value of 407.98±7.29 μm during the 12-month period. Breeding centers were not detected in newborn white bat spleen histological preparations, with the highest incidence of this indicator being in the 3-month period (147.8±6.83 μm), while the minimum was observed in the 12-month period (120.02±2.43 μm).

The highest value of mantle, boundary, periarterial area width was found to occur in the 6 - month period, corresponding to - 46.56±1.06 μm, 80.72±1.36 μm, 89.42±1.06 μm, decreasing after the 6-month period, and corresponding to the 12-month period-41.32±1.22 μm, 72.62±0.89 μm, 79.98±1.06 μm.

The total number of lymphocytes in LTS without a breeding centre was higher at 6 months and in Palm at 9 months, respectively - 57.2±0.87 and 60.3±0.83 cells. In the 3-month period, the rate was the lowest. (respectively - 47.3±1.01 and 46.2±1.1 cells).

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Terining Morfologik Xususiyatlari

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Xulosa: Maqolada "Davolash ishi", "Pediatriya" va "Stomatologiya" mutaxassisliklari bo'lajak shifokorlarining, shuningdek biologiya fakulteti talabalarining kasbiy malakasini samarali shakllantirish maqsadida gistologiya fanini o'qitishning zamonaviy faol va interaktiv shakllariga kiritilgan terining va uning hosilalarining morfofunktsional xususiyatlarini o'rganish bo'yicha ma'ruza materiallari keltirilgan.

Kalit so'zlar: gistofiziologiya, gistokimyo, teri, epidermis, dermis.

Teri tananing sirtini qoplaydi va eng katta organdir. Terining funktsiyalari: himoya (mexanik, radiatsiya, kimyoviy, biologik); retseptor; suv-tuz almashinuvida ishtirok etish (terlash orqali); ekskretor; termoregulyatsiyada ishtirok etish; metabolik; depozit va boshqalar.terining to'siq funktsiyasining ahamiyati uning etishmovchiligi bilan aniq namoyon bo'ladi. Masalan, katta maydonning kuyishi transepidermal suv yo'qotilishi, suvsizlanish, buyrak yetishmovchiligi va shokning kuchayishiga olib keladi, ba'zida bu oqibatlar hayotga mos kelmaydi [1; 2].

Embriogenezda rivojlanish manbalari.

Teri ektodermasi epidermisni keltirib chiqaradi, mezenxima dermis, qon va limfa tomirlari uchun rivojlanish manbai bo'lib, neyroektoderma asab tuzilmalari, retseptorlari va ba'zi epidermal hujayralarni (melanotsitlar va Merkel hujayralari) keltirib chiqaradi.

Terining morfofunktsional xususiyatlari

1. Anatomiyasi. Umumiy maydoni 1,5 – 2 m2 , vazni – 3-5 kg (inson tanasidagi eng og'ir organ). U ikki qismdan iborat – epidermis va dermis. Teri ostida gipoderma joylashgan bo'lib, u bo'shashgan biriktiruvchi to'qima qatlamlari bilan ajratilgan lobulalar shaklida tashkil etilgan yog ' to'qimasidan hosil bo'ladi. Terining harakatchanligini ta'minlaydi. Lipidlar, gormonlar, vitaminlar uchun depo rolini o'ynaydi. Termoregulyatsiyada ishtirok etadi (organizm tomonidan issiqlik yo'qotilishini cheklaydi).

2. Gistologiyasi. Epidermis ko'p qavatli yassi muguzlanadigan epiteliy bo'lib, unda 5 qatlam ajratiladi: bazal (kambiy elementlarni o'z ichiga oladi), tikanli, donador, yaltiroq va shoxli (yassi shoxli qatlamlardan hosil bo'ladi). Epidermis bir necha turdagi hujayralar tomonidan hosil bo'ladi: keratinotsitlar (differentsiatsiya jarayonida ular shoxli tarozilarga aylanadi), melanotsitlar (melanin pigmentlarini sintez qiladi va to'playdi), Merkel hujayralari (mexanoreseptorlar vazifasini bajaradi), Langergans hujayralari (terining immunitet tizimining elementi) va CD8 + xotira T- hujayralari [3; 4; 5]. Bazal membrana o'ralgan konturga ega (epidermal o’siqlar derma qavatidagi so’rg’ichlar bilan almashinadi). Bu epidermisning dermis bilan bog'lanish kuchini oshiradi va o'zaro metabolizm maydonini oshiradi. Epidermisning muhim tarkibiy qismi CD44-epidermal transmembran glikoprotein bo'lib, u keratinotsitlar ko'payishida tartibga soluvchi rol o'ynaydi va gialuron kislotasining mahalliy gomeostazini qo'llab-quvvatlaydi. Yoshi bilan uning tarkibi kamayadi, bu epidermisning ingichkalashiga va terining elastikligining pasayishiga olib keladi. Tabiiy qarish

jarayonida bazal membrana qalinlashadi, uning tarkibidagi kollagen miqdori kamayadi, bu esa o'z navbatida terining mo'rtlashishiga olib keladi [6]. Epidermisning yangilanish davri 20-90 kunni tashkil qiladi (terining maydoniga, yoshiga va boshqa omillarga bog'liq). Epidermisning hosilalari yog ' va ter bezlari, tirnoqlar, sochlardir. Dermis ikki qatlamni o'z ichiga oladi: so'rg'ichsimon (siyrak tolali biriktiruvchi to'qima tomonidan hosil qilingan) va to'rsimon(teriga kuch beradigan zich shakllanmagan biriktiruvchi to'qimalardan). Hujayra tarkibi: fibroblast qator hujayralari, makrofaglar, yetilmagan dendritik hujayralar (DK), semiz hujayralari va ba'zi rezident CD4 + T-xotira hujayralari. Shuningdek, u yog ' va ter bezlari, qon va limfa tomirlari, yog' hujayralari, retseptorlarning aksariyati va asab tolalarini o'z ichiga oladi. Yaqinda dermaning bir qismi sifatida ilgari noma'lum bo'lgan hujayralar turi-telositlar topildi. Ushbu hujayralarning o'ziga xos xususiyatlari kichik o'lchamlari, katta cho'zilgan yadrosi, sitoplazmaning oz miqdori va bir nechta uzun ingichka va qalin o'siqlarning mavjudligi – telopodiya va CD34 va PDGFRa antigenlarini ifodalash qobiliyati (bu ularni fibroblastlar va Langergans hujayralaridan ajratib olishga imkon beradi).ular tashqi o'xshashliklarga ega). Telositlar epidermisning ildiz hujayralariga nisbatan trofik funktsiyani bajaradi, shuningdek fibroblastlar va dermisning biriktiruvchi to'qimalarining boshqa hujayralarini tartibga solishda ishtirok etadi, deb taxmin qilish uchun asoslar mavjud. Yoshi bilan dermisda hujayradan tashqari matritsaning aksariyat komponent molekulalarining tashkil etilishi va arxitekturasida sezilarli o'zgarishlar kuzatiladi. Terining qarishi, shuningdek, oksitalanning yo'qolishi tufayli dermisning papiller va to'r qatlamlarida distrofik elastik tolalarning aberrant cho'kishi bo'lgan elastoz bilan tavsiflanadi [7]. Hozirgi vaqtda ultrabinafsha va infraqizil nurlanish keratinotsitlarda ham, fibroblastik qator hujayralarida ham gen ekspressiyasiga ta'sir qilishi va ajinlar paydo bo'lishiga olib kelishi yaxshi ma'lum [8]. Ruxga bog'liq endopeptidazalar bo'lgan matritsali metalloproteinazalarni (MMP) kodlovchi genlar ECM ekstrasellulyar derma matritsasining asosiy komponentlarini qayta qurishga qodir [9]. Ushbu genlarni ingibirlashda kamida uchta signalizatsiya yo'li faollashadi: mitogen bilan faollashtirilgan kinaz yo'li, stress bilan faollashtirilgan kinaz yo'li (SAPK) va p38 yo'li. MAPK faollashuvi MMP gen ekspressiyasini tartibga soluvchi faollashtiruvchi oqsil 1 (AP-1) transkripsiyasining ko'payishini keltirib chiqaradi [10]. Ikkita c-jun va c-fos Pro-onkogenini o'z ichiga olgan normal inson terisi doimiy ravishda yuqori darajadagi c-fos va junD ni ifodalaydi. Ultrabinafsha va IQ nurlanishida, shuningdek oksidlovchi stressning rivojlanishida aminokislota xromoforlari (Trp, Tyr, Phe, His va Cys) sonining ko'payishi kuzatiladi. Teri va sochlarning rangi melanin pigmentlari – feomelanin (sariq, qizil, jigarrang) va eumelanin (qora) tufayli yuzaga keladi.

3. Sochning tuzilishi. Sochlarning uch turi mavjud: mayin, tukli va uzun. Sochlar mos ravishda terining yuzasi ustida va ostida joylashgan novda va ildizdan iborat. Tashqi tomondan novda kutikula hosil qiluvchi shoxli qatlam bilan qoplangan. Soch o'sishi va yangilanishi uchun mas'ul bo'lgan kambiy elementlar asosan soch ildizining pastki qismida, soch papillasi yaqinida joylashgan. Sochlarning oqarishi pigmentlarning kamayishi va medullada havo pufakchalari to'planishi bilan bog'liq. Sochni ko'taradigan mushak silliq mushak to'qimasidan hosil bo'ladi. Bir uchi soch xaltasiga biriktirilgan, ikkinchisi dermaning so'rg'ichsimon qavatining biriktiruvchi to'qimalariga birlashib ketgan.

4. Terining innervatsiyasi. Afferent (sezuvchi). Funktsional belgilariga ko'ra teri retseptorlari uch guruhga bo'linadi: taktil, termoretseptorlar, og'riq.

A. Taktil retseptorlari turli xil stimullarni (teginish, bosim, tebranish, qitiqlash) taniydi, shuningdek terining sochsiz qismida bosim hissini beradi. Taktil retseptorlarining turlari: 1) erkin nerv uchlari; 2) Merkel disklari; 3) Meissner tanalari; 4) Vater Pacini tanalari; 5) soch follikulalari retseptorlari. Turli xil ixtisoslikdagi retseptor apparatlari terining butun yuzasi bo'ylab notekis taqsimlanadi: 1 sm2 ga o'rtacha 25 ta taktil retseptorlari, 150 – 200 og'riq, 10 – 13 sovuq, 1 – 2 issiqlik retseptorlari to'g'ri keladi. So'nggi yillarda olib borilgan tadqiqotlar teri analizatorining ishlashida papillyarr chiziqlarning muhim rolini ko'rsatdi. Shunday qilib, papillyar naqshlarni saqlab turganda, teri ikki nuqta orasidagi masofani 0,01 mm ga ajratishi aniqlandi, papillyar naqshlaridan mahrum bo'lgan teri esa ikki nuqta orasidagi tashqi bosimning o'zgarishini faqat 1 mm masofada qayd etadi. Ushbu hodisaning mexanizmi shundaki, teri yuzasidagi muntazam chiziqlar chastota filtri sifatida ishlaydi,

shuning uchun tashqi stimuldan taktil retseptorlarga signal qabul qilish uchun maqbul chastota diapazonida uzatiladi. Bunday holda, tizimning eng katta samaradorligiga qo'zg'atuvchi ob'ekt papillyar chiziqlarga perpendikulyar harakat qilganda erishiladi. Aynan shu holat ularni tugun shaklida bog'lanishini ifodalaydi (barmoqlarni har qanday yo'nalishda harakatlantirganda, chiziqlarning bir qismi stimulga nisbatan to'g'ri burchak ostida yo'naltiriladi).

B. Termoreseptorlarning ikki turi mavjud: Ruffini tanalari bilan ifodalangan termal (40 – 420 S); tuzilishi: kapsulali, ko'p tarmoqlanadigan nerv oxirlari; sovuq (25 – 300 S), Krause kolbachalari bilan ifodalanadi; tuzilishi: kapsulalangan tarmoqlanadigan nerv uchlari; erkin nerv uchlari. Termoreseptorlarning to'planishi terida issiqlik va sovuq dog'lar mozaikasini hosil qilishi ko'rsatilgan (diametri taxminan 1 mm), ularning eng katta kontsentratsiyasi yuzning ma'lum joylarida (lablar, burun, peshona) qayd etilgan. Bunday holda, sovuq retseptorlari asosan terining sirt qatlamlarida (taxminan 0,17 mm), termal retseptorlari esa biroz chuqurroq (taxminan 0,3 mm) joylashgan.

B. O'ziga xos og'riq retseptorlari mavjud emas deb hisoblanadi. Ularning vazifasi erkin nerv uchlari — nosiseptorlar (lat. nocens "zararli"), sezgir neyronning dendrit terminallari bo'lgan teri, mushaklar, bo'g'inlar, Periosteum, ichki organlarda keng tarqalgan. Og'riq retseptorlarining o'ziga xos xususiyati maxsus gumoral omillarga – to'qimalarning shikastlanishi yoki yallig'lanishi paytida ajralib chiqadigan algogen moddalarga yuqori sezuvchanlikdir. Ushbu omillar to'qima (gistamin, serotonin, atsetilxolin, vodorod ionlari, kaliy, kaltsiy va boshqalar), plazma (bradikinin va boshqalar), neyrogen (p moddasi, neyrokinin va boshqalar) ga bo'linadi. Ushbu gumoral vositalar asab tugunlari membranasining ion o'tkazuvchanligini o'zgartiradi deb taxmin qilinadi. Efferent (motor) innervatsiya avtonom asab tizimining simpatik postganglionik tolalari bilan ifodalanadi, ular tomirlarning silliq mushaklarida, sochlarni ko'taradigan mushaklarda, ter bezlarida tugaydi. Ikkinchisi ikki tomonlama innervatsiyaga ega deb hisoblanadi – simpatik va parasimpatik.

5. Terini qon bilan ta'minlashi. Arterial va venoz tomirlar uchta tarmoqni hosil qiladi – gipoderma ostida, dermis va gipoderma chegarasida va dermisning retikulyar va papillyar qatlamlari chegarasida. Limfa pleksuslari bir xil lokalizatsiyaga ega. Terining qon tomir tarmog'i diskret printsipga muvofiq tashkil etilgan: uning har bir qismida nisbatan avtonom mikrovaskulyar modul mavjud. Mikrosirkulyatsion kanalning bunday tuzilishi, ko'plab arterio-venulyar anastomozlarning mavjudligi tufayli terining turli mintaqalari (gorizontal) yoki (va) uning turli qatlamlari (vertikal) o'rtasida qon oqimini tez va samarali qayta taqsimlash mumkin, bu termoregulyatsiya funktsiyasini amalga oshirish uchun muhim ko'rinadi. Termoregulyatsiyada etakchi rol terining chuqur venoz tarmog'iga tegishli.

Terini va uning hosilalarini baholashning morfologik usullari. Yorug'lik mikroskopida terining jarrohlik, biopsiya va otopsiya materiallarini umumiy morfologik baholash muntazam bo'yash usuli – gematoksilin va eozin yordamida amalga oshiriladi. Terining hujayra va hujayradan tashqari tarkibiy qismlarini aniq aniqlash uchun gistokimyoviy bo'yashning maxsus usullaridan foydalanish mumkin (masalan: pikrosirusni qizil rangga bo'yash va kollagen tolalariga Van gizon bilan bo'yash; orsein bilan bo'yash va to'qimalarning elastik tolalariga Weigert bilan bo'yash [11]. Hujayralarning ultrastrukturaviy tuzilishini, hujayralararo aloqalarni, bazal membranani (lamina lucida, lamina densa va boshqalar) tahlil qilish uchun transmissiya va skanerlash elektron mikroskopidan foydalaniladi [12]. So'nggi o'n yillikda immunohistokimyoviy usul, FISH, PCR-RV, scRNAseq va boshqalar teri tarkibiy qismlarining biologiyasi va proteomikasini tushunish, shuningdek, normal va ba'zi xavfli o'smalarda turli xil oqsillarning ifodasini tasavvur qilish uchun keng qo'llanilmoqda, ularning natijalari The Human Protein Atlas jamoat xaritalarida qayd etilgan. Immunitet va yallig'lanish reaktsiyalarida terining ishtiroki normal va patologiyada. CD4+ t hujayralaridan farqli o'laroq, CD8 + t hujayralari sitotoksik ta'sirga ega bo'lib, malign yoki infektsiyalangan hujayralarni yo'q qilishga qodir. Ular o'z ichiga oladi MHCI sitolitik molekulalarni, shu jumladan perforin va granzimalarni chiqaradigan yoki Fas-apoptozni keltirib chiqaradigan antigenler [13]. Xotirani shakllantirishda ko'pchilik sitotoksik CD8 + t hujayralari t-bet transkripsiya omilini ifodalaydi va yuqori ifn-γ darajasini chiqaradi. Biroq, ba'zi CD8 + t hujayralari Gata3 ni sintez qiladi va il-4, IL-5

va IL-13 sekretsiyasi bilan ikkinchi turdagi sitotoksik t hujayralarining (Tc2) fenotipini ko'rsatadi. Terining ko'plab shikastlanishlarida (masalan, toshbaqa kasalligi) effektor CD8+ xotira t hujayralari IL-17, IL-22 va IL-17 / IFN-γ ishlab chiqaradi. Xemokin retseptorlarining ifodasi, effektor limfotsitlarning ta'siri va sitotoksiklikning yo'qligi (IL-17 ekspressiyasining oshishi fonida CD49a ekspressiyasining pasayishi) terining shikastlanish joyida to'qima gomeostazining saqlanishini ta'minlaydi. Sichqonlar terisida o'tkazilgan tajribada Tc17 kommensal bakteriyalardan olingan MHCI (H2-M3) tomonidan taqdim etilgan klassik bo'lmagan peptidlarni tanib olishda il-13 ni chiqarish orqali yaralarni davolashga yordam berishi aniqlandi [14]. Umuman olganda, CD4 + va CD8 + t hujayralari juda o'ziga xos funktsiyalarni, yuqumli yoki onkologik tabiatning turli xil shikastlanishlariga komensator–adaptiv reaktsiyalarni, shuningdek yara jarayonini ta'minlaydi. Yuqorida tavsiflangan siotokin muvozanati ham sabab bo'ladi atopik dermatitda epidermisda mikroblarga qarshi oqsillar (AMB) va antiviral oqsillar (AVB) ishlab chiqarishning kamayishi. Bu il-17 ning pasayishi fonida sitokin T2 darajasining oshishi bilan bog'liq bo'lib, natijada keratinotsitlar tomonidan kam AMB ishlab chiqariladi [15; 16; 17], himoya to'sig'ini buzadi va Staphylococcus aureus kolonizatsiyasini, mikrob patogenlari va ularning immunostimulyatsion komponentlarining teriga kirib borishini va ushbu patogen keltirib chiqaradigan infektsiyalarni rag'batlantiradi [18; 19]. Shuning uchun atopik dermatit bilan og'rigan bemorlarda virusli patogenlar, shu jumladan inson papillomavirusi, herpes simplex virusi, molluscum contagiosum virusi va gerpitik ekzema tufayli teri infektsiyalari rivojlanish xavfi ortadi [20; 21]. Shuni ta'kidlash kerakki, teri himoya qatlamining buzilishi, shuningdek, allergenlarga epikutan sezgirlikni oshishiga olib keladi va terining surunkali immun kasalliklari bo'lgan bemorlarda allergiyaning yuqori darajasi yuzaga kelishini tushuntirishi mumkin.

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Observation of Vegetative Disorders in Patients with Chronic Tension Headache and Migraine

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Abstarct: The article covers the effects of chronic tension headaches and migraines, which is one of the most urgent issues in neurology today. The Kerdo index and the Hildebrant factor were used to examine the dynamics of vegetative illnesses, and the findings of the examination were given.

Key points: chronic tension headache, migraine, kerdo index, Hildebrant factor sympathicotonia, normotonia, parasympatheticotonia.

Introduction

The most frequent type of headache is chronic tension headache (CTH), however it is less well understood by professionals than migraine [3-5]. This is because the majority of CTH sufferers never sees a doctor and instead relies on over- the-counter analgesics. The CTH, on the other hand, is a huge medical and societal issue. Despite the fact that there has been relatively little scientific research on the mechanisms and treatment of headache, it is feasible to successfully treat such individuals, despite the fact that no significant advances in novel medicines have been produced in recent years [10]. Since the original classification, the diagnostic criteria for CTH have remained unchanged. The only difference is that the CTH is now divided into three groups, each with a different frequency of the CTH. The first classification proposed the episodic and chronic divisions, which were retained unmodified. Chronic kind is a “severe” disease that causes a significant drop in quality of life, a significant percentage of impairment, and large socioeconomic costs. Patients with uncommon or frequent bouts of hypertension had different disability and pathophysiological aspects in the episodic subgroup. In the second classification, it was decided to separate.

Episodic tension headaches occur once a month or more frequently, up to 15 times a month in rare instances. A rare type of tension headache has essentially no effect on a person and requires medical attention only in the most extreme cases. People who suffer from recurrent headaches are severely disabled, necessitating the use of costly drugs and preventative treatment [9]. Patients were classified into two groups in the first classification: those with and those without pericranial muscular tension.

This classification has been kept in the second edition of the International Headache Classification because sensitivity is the most important distinguishing trait in manual palpation [4,7]. Manual palpation or an algometer can easily detect pericranial muscle tension. Pterygoid, lumbar, trapezius, frontal, temporal, masticatory, and sternocleidomastoid muscles were studied [5]. The clinical signs andpathophysiological abnormalities in response to treatment are comparable, but the frequent and chronic CTH and severe stress in different therapies raises the question of episodic vs chronic division [6].

The differential diagnosis of CTH is complicated by access to the second categorization of chronic migraine. A persistent migraine or headache that fits the CTH criteria for at least 15 days per month is required for both diagnosis. A patient could theoretically have both diagnoses.

Many patients with CTH have drug addiction; the diagnosis should be made using the criteria for drug overuse [7, 9], and the occurrence of headache in the patientshould be ruled out.

CTH usually proceeds from an episodic to a chronic stage in most patients; however, if the headache becomes chronic within three days, it is characterized as a new daily persistent headache. The annual prevalence of episodic tension headache was 63 percent in the most extensive epidemiological investigation yet undertaken in Denmark [11]. (56 percent in men and 61 percent in women). CTH was found in 3% of people (2 percent in men and 5 percent in women). With a male to female ratio of4 to 5, gender differences were statistically significant.

With age, the prevalence of CTH diminishes. CTH was found to be present in

4.1 percent of people in the United States. The prevalence of CTH was reported to be 2% in a survey of 2,500 university students in the United States [13].

CTH has a substantially bigger socioeconomic impact than other types of headaches due to its high prevalence [9]. To yet, it is unclear whether headaches are caused by a central or peripheral mechanism [8, 9].

Materials and methods

General characteristics of clinical material

117 patients, age 17-61 (average age 38.5 ± 10.36) were selected for the clinical part of the study. Of these, 30 (25.64%) were males and 87 (74.36%) were females (Figure 1).

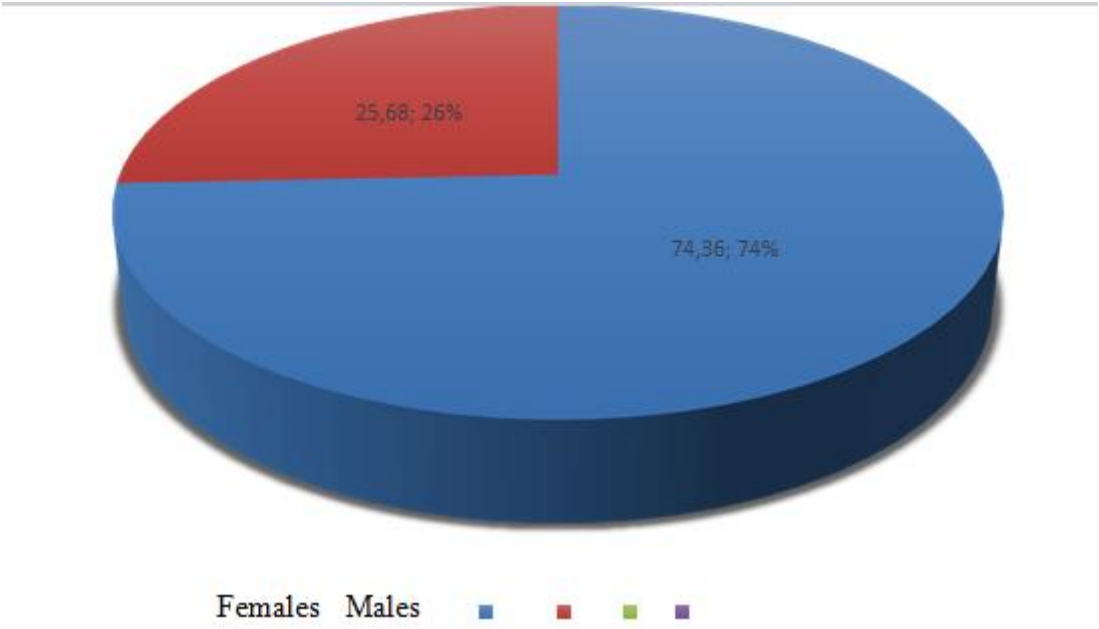


Figure 1

Distribution of patients by sex

By age of patients: 13-20 years - 2, 21-30 years - 9, 31-40 years - 36, 41-50 years - 30, 51-60 years - 19 and over 60 - 1 patient. The specificity of the distribution of patients by age is predominant among women in all age groups (Figure 2).

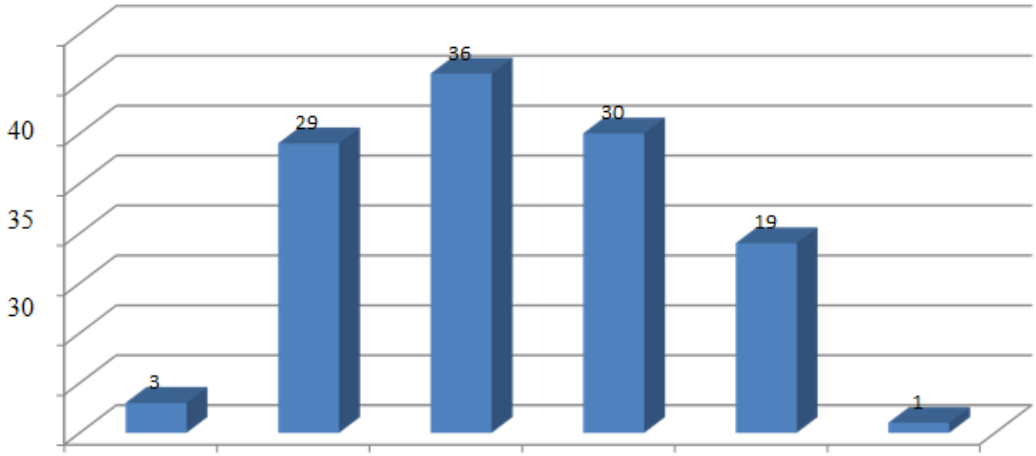
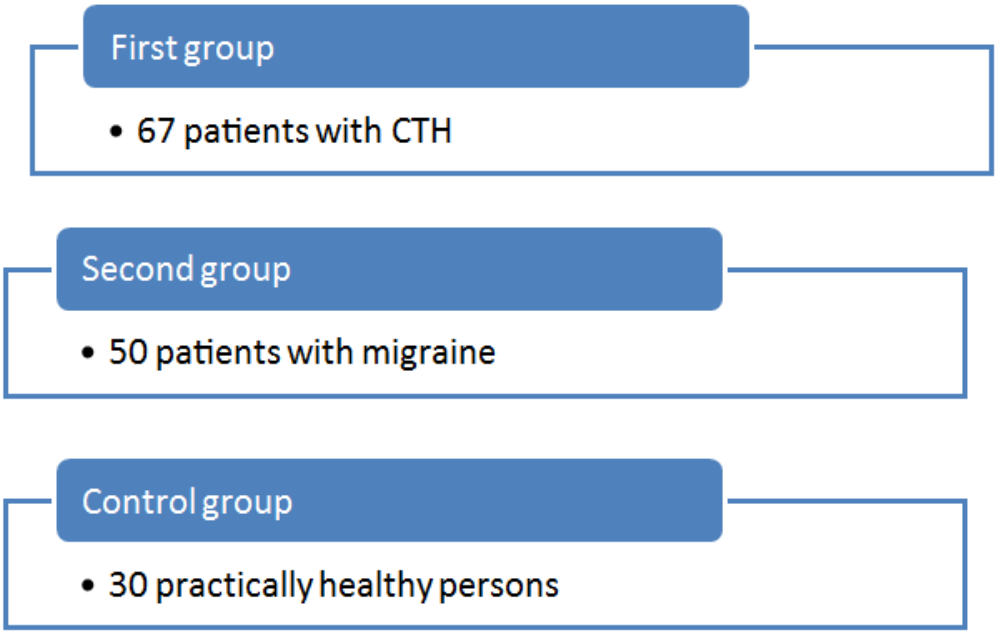


Figure 2 Distribution of patients by age

All patients complained of tension-induced headache b (G44.2 according to XKT (ICT) -10).

Patients were studied in two groups, the first group consisted of 67 patients with chronic tension headache, the second group consisted of 50 patients with migraine, and the third group consisted of 30 practically healthy patients.



In the study, patients were selected according to the following parameters (Table1).

Table 1 Criteria for diagnosing the patients

	Diagnosis criteria
Migraine	The diagnosis of migraine patients was made on the basis of the following symptoms: Severe, paroxysmal headache, nausea, photophobia, phonophobia. No focal neurological changes in neurostatus. Neurovisual examination revealed MRI, ICLS, MRI Angiography, angiography and cerebral vascular ultrasound examination, no pathological changes.
CTH	The patient has been complaining of tension headache and no changes in

	neurostatus, neurovisuolization examination are detected. The duration of the headache is not less than 30 minutes, in episodic tension headaches from 30 minutes to 7 days, in chronic tension headaches the headache does not stop every day.The nature of the headache - squeezing, crushing, pressing, monotonous. Not observed in the loose character. Localization of headache - diffuse, bilateral. Headaches do not increase with daily physical activity.

All patients underwent a clinical neurological examination, after which theautonomic nervous system Kerdo index and Hildenbrant coefficient were determined. The results were statistically processed using the computer programs SPSS (22.0). The absolute and relative number of patients, the mean value, and the standard deviations are the statistical indicators given for the amount of data reviewed. Whencomparing patient groups, the following non-parametric criteria are used: TheWilcoxon criterion was used to compare two interrelated characters, the Friedman criterion was used to compare three or more unrelated characters, the Manna-Whitney criterion was used to compare two unrelated characters, and the Kraskell-

Woless criteria were used to compare three or more unrelated characters. The result was a statistically significant r <0.05.

The Results:

Despite advances in medicine, the biology of migraine remains a mystery to this day. Vasoconstriction due to decreased vascular tone of the cerebral arteries, on the other hand, is thought to play a crucial part in the pathophysiology of migraine onset. There are no data on histological changes in the cerebral arteries and surrounding tissues in migraine patients who have undergone biopsy to support this notion. These histological and electro-microscopic studies, in particular, show no signs of vasculitis or active inflammatory processes [5,3,16]. Excessive sympathetic nervous system activation might cause vascular tone regulation problems in migraine sufferers. The existence of pheochrocytoma may play a role in the development of this illness, and hyperactivity of the sympathetic nervous system can be treated with sympathomimetics for blood pressure fluctuations associated with migraine.

Examinations of the autonomic nervous system are used to determine the toneof the sympathetic and parasympathetic nervous systems based on the above data.

The Kerdo index is an indicator used to evaluate VNS performance.

Calculated according to the following formula:

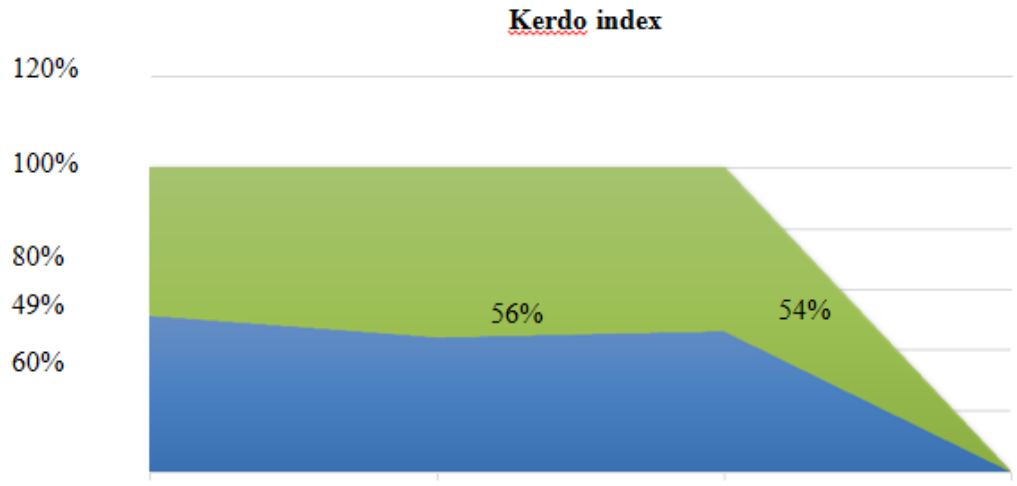
$$(1 - \frac{DAB}{FQS}) \text{ x}100,$$

Here, DAB is the diastolic blood pressure (mm sm), YQS is the number of heartbeatsper minute.

Interpretation of the Kerdo index: if the value is higher than 0, it is consideredsympathotonia, if it is less than 0, it is considered vagotonia.

Table 2. Calculation by Kerdo method, distribution of patients depending on the indicators of vegetative tone.

Kerdo index	migraine (n=50)	CTH (n=67)	Practicallyhealthy (n=30)	Хи-square
Sympathotonic	21	34	14	χ^2=4,5
Vagotonic	29	33	16	p<0,05



Kerdo index results showed that in our CTH patients 34 patients (51%) were sympathetic, 33 patients (49%), 56% of patients with migraine were sympathetic, 44% were vagotonic (Figure 3). The sympathetic nerve tone of the patients increased (χ^2 = 4.5 r <0.05) (table 3).

The Hildenbrandt coefficient is an indicator used to estimate the superiorityof the sympathetic or parasympathetic part of the VNS and is calculated by the following formula:

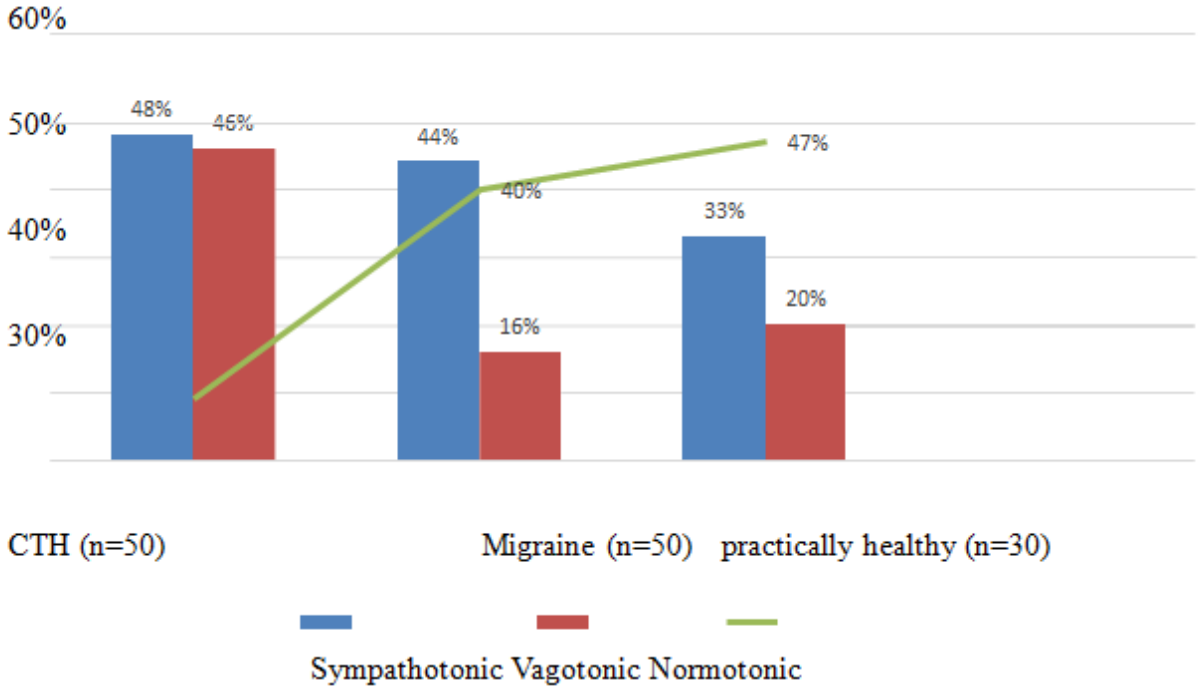
K = YQS / NS

Normally, K = 2.8-4.9. K> 4.9 - sympathicotonicK <2.8 - vagotonic.

Table 4. Distribution of patients depending on the indicator of vegetative tone,calculated by the Hildenbrandt method.

	Migraine(n=50)	CTH (n=67)	III group(n=30)	Хи- square
Sympathotonic	22	32	10	χ^2=3,17
Vagotonic	8	31	6	p>0,05
Normotonic	20	6	14	

Figure 4 Hildenbrant coefficient



The analysis of the indicators of the Hildenbrant coefficient in patients and practically healthy people revealed that that the sympathetic nervous system predominates in 48% of patients with CTH. In addition, an increase in sympathetic tone was found in 44% of patients with migraine (ch2 = 3.17 r> 0.05). In this case, the predominance of sympathetic tone over parasympathetic tone is confirmed by the pathophysiological effects of the sympathetic nervous system on the development of vasoconstriction in migraine and CTH (Figure 4).

Conclusion

When the Kerdo index data were analyzed, 34 patients (51%) of CTH patients were classified as sympathetic, 33 patients (49%) as vagotonic, 56 percent of migraine patients were sympathetic, 44 percent were vagotonic, and patients exhibited an increase in sympathetic nerve tone (χ^2 = 4.5 r 0.05). Patients in groups II and III were found to have a vagotonic column. CTH patients were found to have sympathetic nervous system predominance in 48 percent of instances, and sympathetic tone was found to be raised in 44 percent of migraine patients (χ^2 = 3.17 r > 0.05) when Hildenbrant coefficients were analyzed in patients and virtually healthy people. The pathophysiological effects of the sympathetic nervous system on the development of vasoconstriction in migraine and CTH are confirmed by the predominance of sympathetic tone over parasympathetic tone in this condition. In such circumstances, the sympathetic nervous system's dominance over the parasympathetic nervous system validates the sympathetic nervous system's pathophysiological effects on the development of vasoconstriction in the development of CTH and migraine. Vasoconstriction is the key pathophysiological mechanism in the development of CTH and migraine, and it is caused by a lack of control of cerebral artery tone. In light of the foregoing, it's critical to assess the tone of the sympathetic and parasympathetic nervous systems during an autonomic nervous system evaluation.

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