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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

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თანამშრომლობითა და მისი პატრონაჟით

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ
ТБИЛИСИ - НЬЮ-ЙОРК

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2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

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4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრაფიების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

Содержание:

Камышанский Е.К., Костылева О.А., Мусабекова С.А., Тусупбекова М.М., Копобаева И.Л. ФЕТО-ФЕТАЛЬНЫЙ ТРАНСФУЗИОННЫЙ СИНДРОМ: ВОЗМОЖНОСТЬ ЛАТЕНТНОГО ТЕЧЕНИЯ (СЛУЧАЙ ИЗ ПРАКТИКИ).....	7
Васильев Д.В. СОВРЕМЕННЫЕ ПОДХОДЫ К КОРРЕКЦИИ ГИПЕРНАТРИЕМИИ У НЕЙРОХИРУРГИЧЕСКИХ БОЛЬНЫХ	12
Хачатрян А.С. ОБЗОР КЛИНИЧЕСКИХ СЛУЧАЕВ МНОЖЕСТВЕННЫХ ПЕРВИЧНЫХ ОПУХОЛЕЙ ОРГАНОВ МОЧЕПОЛОВОЙ СИСТЕМЫ У МУЖЧИН	17
Хачатрян А.С. ОБОСНОВАНИЕ ИНТРАОПЕРАЦИОННОГО ГИСТОПАТОЛОГИЧЕСКОГО ИССЛЕДОВАНИЯ ТЕРАТОМ ЯИЧНИКА	22
Beriashvili S., Nikolaishvili M., Mantskava M., Momtsemlidze N., Franchuk K. CHANGES IN TOOTH HARD TISSUE MINERALIZATION AND BLOOD RHEOLOGY IN HEALTHY ADOLESCENTS AND THOSE WITH THYROID DYSFUNCTION	28
Abrahamovych O., Abrahamovych M., Tolopko S., Fayura O., Ferko M. CHARACTER AND FREQUENCY OF THE VARIATIONS OF CO- AND POLYMORBID SYNTROPIC EXTRAHEPATIC LESIONS AND THEIR DEPENDENCE ON THE HEPATOPULMONARY SYNDROME SEVERITY DEGREE IN CIRRHOTIC PATIENTS	34
Tsagareli Z., Kvachadze T., Melikadze E., Metreveli L., Nikobadze E., Gogiashvili L. HURTLER CELLS IMMUNOHISTOCHEMICAL ACTIVITIES IN HASHIMOTO THYROIDITIS PARENCHYMA.....	42
Botchorishvili I., Sharashidze N., Pargalava N., Pagava Z., Saatashvili G. DIFFERENCES IN ECG CHARACTERISTICS AND CO-MORBIDITIES AMONG PATIENTS WHO UNDERWENT ELECTIVE SURGICAL REPAIR	47
Цискаришвили Н.И., Кацитадзе А.Г., Цискаришвили Н.В., Цискаришвили Ц.И., Читанава Л.А. ЭФФЕКТИВНОСТЬ КОМБИНИРОВАННОГО ПРИМЕНЕНИЯ АНТИОКСИДАНТНОЙ И ФОТОТЕРАПИИ В ЛЕЧЕНИИ ВИТИЛИГО	52
Курбанова З.Т., Бахшалиев А.Б., Байрамов Р.И., Исмаиладзе Д.М. ОПРЕДЕЛЕНИЕ ВЗАИМОСВЯЗИ РАЗЛИЧНЫХ ПАТОГЕНЕТИЧЕСКИХ ФАКТОРОВ И АРИТМИЙ У БОЛЬНЫХ ТУБЕРКУЛЕЗОМ ЛЕГКИХ И САХАРНЫМ ДИАБЕТОМ	57
Semianchuk V., Haridzhuk L., Bobrykovych O. INDICATORS OF PHAGOCYTIC COMPONENT AND SECRETORY IGA IN CHILDREN WITH BRONCHIAL ASTHMA SECONDARY TO UNDIFFERENTIATED CONNECTIVE TISSUE DYSPLASIA.....	61
Закревский А.Н., Карапетян О.Ю., Агашков В.С., Косенко К.А. УЛЬТРАЗВУКОВОЙ МОНИТОРИНГ ЦЕНТРАЛЬНОЙ И ЦЕРЕБРАЛЬНОЙ ГЕМОДИНАМИКИ ПРИ КОРРЕКЦИИ АРТЕРИАЛЬНОЙ ГИПОТЕНЗИИ У НЕДОНОШЕННЫХ НОВОРОЖДЕННЫХ	68

Юсифов З.А., Лохвицкий С.В., Гуляев А.Е. ОСОБЕННОСТИ ФАРМАКОКИНЕТИКИ АНТИБИОТИКА ЦЕФТРИАКСОН ПРИ ВНУТРИВЕННОМ ВВЕДЕНИИ ПРЕПАРАТА, ДЕПОНИРОВАННОГО В АУТОЛОГИЧНЫХ ЭРИТРОЦИТАХ И ЛЕЙКОЦИТАХ КРОЛИКА	74
Ахвледиани Л.Т., Коинава Т.Н., Ломтадзе Л.Б., Джохадзе М.С., Мхиладзе Л.В., Берашвили Д.Т., Бакуридзе А.Д. СРАВНИТЕЛЬНЫЙ АНАЛИЗ АНТИБАКТЕРИАЛЬНЫХ ЭФФЕКТОВ ФИТОПРЕПАРАТОВ И АНТИБИОТИКОВ	79
Korshun M., Dema O., Kucherenko O., Korshun O., Garkavi S., Pelio I., Antonenko A., Velikaia N. PREDICTING OF RISKS OF GROUNDWATER AND SURFACE WATER POLLUTION WITH DIFFERENT CLASSES OF HERBICIDES IN SOIL IN EASTERN EUROPE CLIMATE CONDITIONS	86
Клименко Т.М., Сердцева О.А., Сандуляк Т.В., Закревский А.Н., Карапетян О.Ю. ПОДГОТОВКА СПЕЦИАЛИСТОВ ПО НЕОНАТОЛОГИИ В РЕЗИДЕНТУРЕ	90
Myronchenko S., Naumova O., Zvyagintseva T. THE IMPACT OF ULTRAVIOLET IRRADIATION ON MORPHO-FUNCTIONAL STATE OF SKIN IN GUINEA PIGS	95

THE IMPACT OF ULTRAVIOLET IRRADIATION ON MORPHO-FUNCTIONAL STATE OF SKIN IN GUINEA PIGS

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With the increase in ultraviolet (UV) irradiation reaching the Earth's surface, a change in lifestyle habits with habitual recreation at southern resorts the frequency of UV-induced skin damage and a demand for photoprotective agents have been steadily increasing [5,6]. The skin, which is not only a barrier against external factors, but also actively participates in vital activities, undergoes direct damage when exposed to ultraviolet irradiation [5,6]. Exposure to UV irradiation, associated with the damage to skin structure, results in the formation of a severe response involving all skin components [1,7]. In this regard, it is important to study morpho-functional peculiarities of the skin under the action of UV rays.

The purpose of the study - to determine the effect of UV irradiation on morpho-functional state of the skin in guinea pigs.

Material and methods. The study involved 30 albino guinea pigs weighing 400-500 g. Erythema was caused by the exposure of a shaved skin site to irradiation using a mercury quartz irradiator OKN-11-M, placed at a distance of 10 cm from the animal, lasting for 2 minutes. In addition, the skin was shielded by a round plate with five holes with a diameter of 6 mm. The extent of the reaction was evaluated within 2, 4 hours, 3 days following the exposure until erythema disappearance in points for each spot: 0 points – no erythema, 1 point – distinct redness, 2 points – intense erythema. Then we summarized the intensity of 5 spots. The level of damaging effect was assessed by the intensity and duration of erythema reaction [1]. Control group consisted of intact guinea pigs. Morphological peculiarities of local changes in the skin after ultraviolet irradiation the animals were studied at different stages of the trial (2 hours, 4 hours, 3 days, 8 days). The solution of sodium thiopental was used for euthanasia. Animal housing and experiments on them have been carried out in compliance with the requirements of international principles of the «European Convention for the protection of Vertebrate Animals Used for Experimental and other Scientific Purposes» (Strasbourg, 1985) and «General Ethic Rules for Conducting Experiments on Animals», approved by the First National Congress on bioethics (Kiev, 2001).

Skin pieces were fixed in 10% neutral formalin with further excision of pieces of about 4 mm thick. The material was subjected to dehydrating and paraffin bedding which was then cutting in pieces of 5-6 µm thick. Survey specimens stained with hematoxylin and eosin were used to assess

the overall state of the tissue. Weigert's elastic stain with fuchselin followed by Van Gieson's counterstain with picro-fuchsin was used to identify and differentiate the structures of the connective tissue [2,3].

Specimens, stained by histological and histochemical methods, were studied using Olympus BX-41 microscope with Olympus DP-Soft software (Version 3:1).

Results and their discussion. Local exposure to UV irradiation resulted in the development of erythema in all the guinea pigs. In 2 hours after the exposure the total erythema score amounted for 4.8 points. The maximum severity was registered in 4 hours after the exposure when the overall intensity of 5 spots increased to 9.2 points. On the 3rd day the overall intensity of erythema was severe, comprising 7.7 points, with a subsequent gradual decrease and disappearance on the 8th day.

Histological study of the skin in intact animals ("norm") showed typical features of organ structure: the skin comprising the epidermis and dermis with the lower level of subcutaneous fat and muscle tissue. The epidermis comprised stratified squamous keratinized epithelium of four layers: basal (Malayer), spinous, granular and corned. The basal layer consisted of a single layer of oval epithelial cells with moderately basophilic cytoplasm and rounded basophilic nuclei with mitotic figures in some cell. Apart from epidermal cells, the basal layer was found to contain Langerhans cells (intraepidermal macrophages). The spinous layer consisted of two rows of somewhat smaller polygonal epidermal cells with clear cytoplasm and moderately basophilic rounded or slightly elongated nuclei. The granular layer comprised one or two rows of flattened cells with keratohyalin granules in their cytoplasm, intensively absorbing basic dyes. Eosinophilic horny scales of the stratum corneum closely adjacent to each other did not contain nuclei. Basal membrane of the epidermis was thin and continuous.

Dermis consisted of the papillary and reticular layers. The papillary layer was formed by loose connective tissue with thin bundles of elastic and fuchselinophilic collagen fibers as determined by Weigert's elastic stain with fuchselin followed by Van Gieson's counterstain with picro-fuchsin. Inconsiderable amount of cellular elements, such as fibroblasts, macrophages, tissue basophils and lymphocytes were visualized between fibrous structures. The reticular layer was formed by wide bundles of fuchsinophilic col-

lagen fibers and a network of elastic fibers with a small number of fibroblasts and fibrocytes situated parallel to and at an angle to the skin surface. The reticular layer comprised hair roots and sebaceous glands associated with them. The ostium of hair follicles opened to the skin surface. Capillaries situated in the papillary and reticular layers were shown to have well-defined lumen with a moderate amount of blood cells, mainly erythrocytes. Vascular basal membrane was thin and continuous. Flat endothelial cells uniformly placed on vascular basal membrane were found to have slightly basophilic cytoplasm and a somewhat elongated nuclei, moderately absorbing basic dyes. Vessels were surrounded by occasional inconsiderable accumulations of macrophages and lymphocytes.

Subcutaneous fat layer of adipose tissue lobules consisted of large adipocytes with small basophilic nuclei and optically empty cytoplasm. Fat lobules were bounded by moderately fuchsinophilic bundles of collagen fibers extending from the reticular dermis, some of which included fibroblasts, lymphoid cells, vessels and nerve trunks.

Subadjacent muscle tissue comprised striated muscle fibers, separated by layers of loose connective tissue. Small arteries of subcutaneous fat and muscle layers were convoluted with a markedly uneven tone and lumen with blood formed elements, mainly erythrocytes. Endothelial cells were flat and vertically arranged at spasm sites. Veins were somewhat convoluted, with a distinct lumen, moderately filled with blood with evenly spaced endothelial cells containing moderately basophilic slightly elongated nuclei.

Structural and functional assessment of the skin tissue in intact guinea pigs is of significant interest for the identification of morphological changes in exposure to UV irradiation in control animals.

A morphological study of the skin in guinea pigs exposed to UV irradiation determined disruptions of its histological structure occurring within 8 days.

Consequently, 2 hours following the exposure to UV irradiation, the epidermis, represented by stratified squamous epithelium, was found to contain four layers: basal (malpighian), spinous, granular and horny. The malpighian layer consisted of one row of cells with rounded or oval basophilic nuclei; the spinous layer was formed by 1-2 rows of slightly smaller cells with nuclei absorbing basic dyes less readily and faintly basophilic cellular cytoplasm. The granular layer was composed of 1-2 rows of small cells with intensely basophilic inclusions of keratohyalin in cytoplasm. The stratum corneum was formed by the rows of closely adjacent non-nuclear eosinophilic horny scales. The basal and spinous layers were found to have separate cells or small groups of cells containing 2-3 epidermal cells with somewhat smaller rounded or elongated nuclei and optically empty or slightly eosinophilic cytoplasm. The

basal layer comprised occasional epidermal macrophages (Langerhans cells) and mitotic figures. The integrity of the dermo-epidermal junction was preserved in all the specimens; however, the basal and spinous layers of the epidermis were shown to contain small foci of optically empty transudate in the intercellular spaces with separation of epidermal cells ("spongiosis") and loss of cellular connectivity (acantholysis), which resulted in the formation of vacuolization loci in the region of dermo-epidermal junction in 2 specimens (Fig. 1).

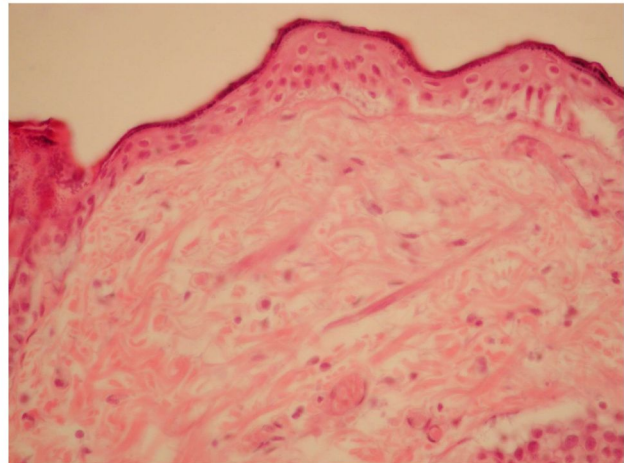


Fig. 1. Small loci of acantholysis and spongiosis in the epidermis with vacuolization in the region of dermo-epidermal junction. Moderate congestion of dermal capillaries. Guinea pigs in 2 hours following local exposure to UV irradiation. H&E stain, x200

Dermal papillae were wide, flattened and composed of loose connective tissue with thin bundles of fuchsinophilic brick-red collagen and black elastic fibers as determined by Van Gieson's stain with Weigert's elastic counterstain. The reticular layer was formed by extensive fuchsinophilic bundles of collagen fibers arranged parallel to and at an angle to the skin surface, and their accompanying network of elastic fibers. Inconsiderable amount of fibroblasts and fibrocytes with slightly eosinophilic cytoplasm and rounded nuclei faintly absorbing basic dyes was visualized between fibrous structures of papillary and reticular layers. Dermal capillaries with slightly enlarged lumen were filled with blood elements, mainly erythrocytes. The lumen of some vessels was found to comprise isolated leukocytes with signs of margination. Endothelial cells lining the vessels appeared dissociated, due to the enlargement of the lumen. Their cytoplasm was eosinophilic, with elongated nuclei, readily absorbing basic dyes. Vascular basement membrane was thin and continuous. Small accumulations of macrophages or histiocytes (Fig. 2), lymphocytes and mast cells were identified mainly around the vessels. Accessory organs of the skin (hair follicles and sebaceous glands) were found to possess normal structure with hair roots reaching the lower parts of the reticular layer and ostia opening to the surface of the skin. Accessory organs of the skin were surrounded by small focal lymphohistiocytic infiltrates.

Microscopic examination in 4 hours following the exposure to UV irradiation showed that the epidermis in animals' skin specimen preserved its stratified structure. In half of the cases the basal layer of the epidermis was found to contain individual cells with shrunken basophilic nuclei and intensely eosinophilic cytoplasm ("sunburn" cells). Individual basal cells or their small groups with rod-shaped or rounded picnotic, intensely basophilic nuclei, shifted to the periphery of the cell cytoplasmic membrane, were visualized in some regions of the epidermal basal cells in 3 specimens. The cells were filled with vacuoles containing cytoplasmic fluid appearing optically empty. The study also identified an insignificant amount of mitotic figures. In half of the cases specimens were shown to undergo focal spongiosis and acantholysis of basal epidermal cells with the development of degenerative changes in the form of mild vacuolization in the region of dermo-epidermal junctions. Collagen fibers of the dermis papillary and reticular layers were slightly swollen with reduced fuchsinophilia as compared to the previous period, appearing homogeneous in one specimen. In 2 cases elastic fibers were partially thickened and disrupted. Spaces between connective tissue fibers were slightly enlarged due to exudate accumulation (Fig. 2).

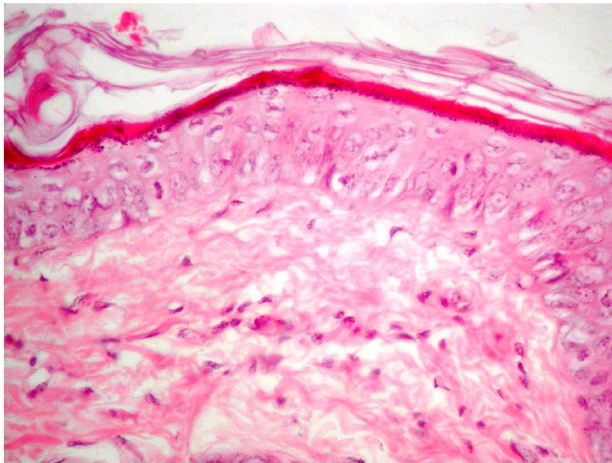


Fig. 2. Vacuolar degeneration of basal epidermal cells. Edema and congestion of dermal vessels with small focal perivascular lymphohistiocytic infiltrates. Guinea pigs, 4 hours following local exposure to UV irradiation, H&E stain, x400

There was an inconsiderable amount of fibroblasts and fibrocytes between fibrous structures of the dermis, with no signs of functional activity. Vessels of the superficial and deep vascular plexi of the skin were dramatically enlarged, congested, mainly with erythrocytes and a small number of neutrophils, some with signs of margination and outwandering through the vascular wall of individual cells. Endothelial cells were shown to be dissociated and enlarged due to the enlargement of intensely basophilic nuclei, which protruded into the lumen of the vessel. Vascular basal membrane was continuous. Small focal lymphohistiocytic infiltrates with an admixture of mast cells were visualized around the vessels and accessory organs of the skin.

On the 3rd day the skin specimens were found to contain a slight thickening of the epidermis due to an increase in the number of the rows of spinous cell layer to 2 or 3. Epidermal cells of the spinous layer were predominantly found to have signs of vacuolar degeneration; in all the specimens they included numerous sunburn cells, i.e. cells with pyknotic nuclei and eosinophilic cytoplasm. The latter were arranged singly and in 2 specimens they were arranged in groups of 3 to 4. Basal keratinocytes were located close to each other, with intensely basophilic nuclei and mainly vertical orientation. The specimens were also shown to have numerous mitoses. Epidermal macrophages were not detected. The stratum corneum was thickened, with areas containing surviving cells with nuclei (parakeratosis). In half of the specimens the epidermis contained foci of small clusters of leukocytes. Basal membrane was found to have loci of thickening. All the specimens had signs of dermo-epidermal activity with the formation of areas of vacuolization and mild disintegrative changes in the dermo-epidermal junction in 3 specimens. Swelling of the dermis persisted and consequently, collagen and elastic fibers, making up its structure, appeared dissociated. Collagen fibers in all the specimens were swollen, unevenly fuchsinophilic and homogeneous in 5 cases. Elastic fibers were thickened with sites of disruption in all the specimens. The study showed that the dermis was infiltrated with polymorphonuclear leukocytes with density ranging from mild to moderate. Dermal regions adjacent to the loci of degenerative and destructive changes in the dermo-epidermal junction were found to undergo mild proliferation of fibroblasts. As opposed to the previous period, dermal vessels had lesser severity of congestion and dissociation of endothelial cells which line them (Fig. 3).

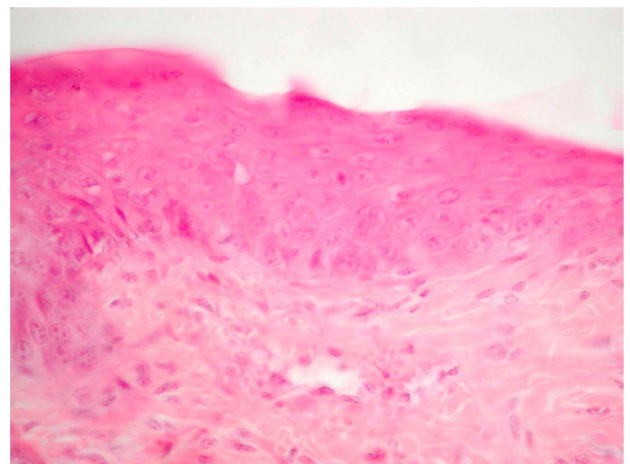


Fig. 3. Sunburn cells in the upper layer of the epidermis. Increased proliferative activity of the basal layer cells. Congestion of dermal vessel, accompanied by dissociation of swollen endothelial cells. Guinea pigs on the 3rd day following the local exposure to UV irradiation. H&E stain, x400

Moreover, the majority of endothelial cells were large, protruding to vascular lumen, with rounded nuclei, read-

ily absorbing basic dyes. Vascular basal membrane was continuous. Occasional small focal hemorrhages were visualized around the vessels mainly in the papillary layer. The basal layer of hair sheath epithelium was found to comprise a large number of cells with nuclear hyperchromia and numerous mitotic figures. Regions around the vessels and accessory organs of the skin were filled with infiltrates of lymphocytes, macrophages, small number of tissue basophils and neutrophils slightly more frequently as compared to the previous period.

Microscopic examination of animals' skin specimens on the 8th day of the trial (at the time of erythema disappearance) showed thickening of the epidermal layer at the cost of the spinous, granular and horny layers. The expansion of the spinous layer resulted both from an increase in the number of rows of its cells to 4-5, and consolidation of epidermal cells due to the overflow of cytoplasmic fluid which appeared optically empty; at that, cell nuclei were pyknotic, usually rod-shaped and slightly basophilic (vacuolar degeneration). Four specimens contained foci of epidermal hyperplasia, with the number of spinous layer rows reaching 8-12 (acanthosis foci). Mainly vertical orientation of cell nuclei in the basal layer of the epidermis was preserved, undergoing numerous mitoses, though their number decreased as compared to the previous period. The number of rows of the granular layer increased to 2-3, with consolidation of its cells. The stratum corneum was found to be thickened (hyperkeratosis), loose and voluminous with loci of parakeratosis. The intensity of swelling of the dermis decreased as compared to the previous period, with a more consolidated arrangement of connective tissue fibers. In all the specimens unevenly fuchsinophilic collagen and elastic fibers were thickened, the latter being focally disrupted. Foci of fibroblast proliferation with overproduction of collagen fibers, forming thin fuchsinophilic bundles, oriented parallel to the skin surface, were visualized at the base of the papillae (Fig. 4).

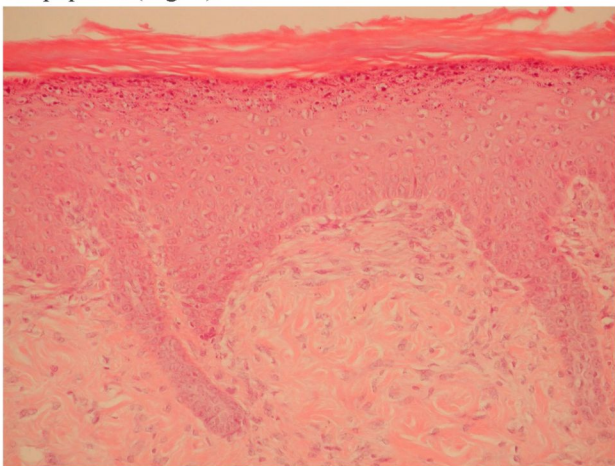


Fig. 4. Hyperkeratosis and acanthosis of the epidermis. Focal proliferation of fibroblasts at the base of dermal papillae. Guinea pigs on the 8th day following the local exposure to UV irradiation. H&E stain, x200

In 3 specimens the epidermis and dermis were found to contain small focal infiltrates of polymorphonuclear leukocytes. Vessels had distinct lumen, moderate blood supply, lined with saturated endothelium with large nuclei in the foci of fibroblasts proliferation. Endothelial cells in the dermal vessels at other sites were flattened and had numerous elongated basophilic nuclei. Vascular basement membrane was thin and continuous. The vessels were surrounded by focal lymphohistiocytic infiltrates. Accessory organs of the skin had signs of mitotic activity in the basal layer of hair sheaths.

Thus, microscopic examination showed morphological pattern of acute inflammation in the animals' skin within the first three days following the exposure to UV irradiation. In 2 hours after the exposure to UV irradiation these changes were minimal and were characterized by mild exudative changes in the form of mild congestion of the vessels and margination of leukocytes in their lumen, as well as the development of dermo-epidermal activity. Alterations developing at the 4th hour of the trial, involved an increase in dyscirculatory changes, morphologically manifested by severe vascular congestion with endothelial swelling and edema of the epidermis with loss of cellular connectivity and edema of the dermis vacuolization of tissue in the region of dermo-epidermal junction; leukocyte infiltration of the dermis was abundant.

Structural components of the skin underwent alterative changes, morphologically manifested by vacuolar degeneration and the development of epidermal cells apoptosis ("sunburn" cells). Disappearance of epidermal macrophages and mild changes in collagen and elastic fibers also were resented the dermis. Histopathological changes persisted and reached at maximum severity on the day 3rd of the trial. At the time of erythema disappearance (the 8th day after the exposure) the exudative phase of inflammation gave way to proliferation. Increased proliferative activity of basal keratinocytes resulted in the development of the epidermal cells hyperplasia, associated with degenerative changes in epidermal cells and dyskeratosis. An increase in proliferative and synthetic activity of fibroblasts promoted collagenization of the dermis, changes in the content and structure of elastic fibers. Moreover, there was a decrease in lymphohistiocytic infiltration of the dermis.

Conclusions.

1. Following the exposure to UV irradiation in the minimal erythema dose guinea pigs were shown to develop inflammatory and degenerative changes in the skin reaching its maximum severity on the 3rd day after irradiation.
2. Inflammatory and degenerative changes, including dystrophic alterations, persisted during post-erythema period (on the 8th day).

Perspectives. The prolonged nature of the changes in the skin is suggestive of the development of chronic inflammation in the skin, necessitating the elaboration of therapeutic and preventive measures to eliminate the negative effects of UV irradiation.

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SUMMARY

THE IMPACT OF ULTRAVIOLET IRRADIATION ON MORPHO-FUNCTIONAL STATE OF SKIN IN GUINEA PIGS

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The purpose of this study was to assess the impact of ultraviolet irradiation (UV) on morphological and functional condition of the skin in guinea pigs. The study involved 30 albino guinea pigs weighing 400-500 g subjected to local exposure to UV irradiation. Control group consisted of intact guinea pigs. Histological studies of the skin were carried out at different stages of the trial (2 hours, 4 hours, 3 days, 8 days following the exposure). Microscopic examination showed morphological signs of acute inflammation in the skin of animals within the first three days following the exposure to UV irradiation.

Within 2 hours following the exposure to UV irradiation these changes were minimal with signs of mild exudative changes. In 4 hours after the exposure histological changes increased. The specimens were also found to contain altered apoptotic keratinocytes (sunburn cells). Histopathological changes persisted and reached maximum severity by the 3rd day. Within post-erythema period (the 8th day) proliferative, hyperplastic, degenerative and dystrophic changes in the skin persisted. The prolonged nature of the changes in the skin is suggestive of the development of chronic inflammation in the skin of guinea pigs subjected to local exposure to UV irradiation.

Keywords: ultraviolet irradiation, skin, morphologic changes.

РЕЗЮМЕ

ВЛИЯНИЕ УЛЬТРАФИОЛЕТОВОГО ОБЛУЧЕНИЯ НА МОРФОФУНКЦИОНАЛЬНОЕ СОСТОЯНИЕ КОЖИ МОРСКИХ СВИНОК

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Целью исследования явилось установление влияния ультрафиолетового облучения (УФО) на морфофункциональное состояние кожи морских свинок. Исследования проведены на 30 морских свинках-альбиносах массой 400-500 г, подвергшихся локальному УФО. Группой контроля служили интактные морские свинки. Гистологические и гистохимические исследования кожи были проведены на разных сроках эксперимента (2 часа, 4 часа, 3 суток, 8 суток после облучения). Установлено, что микроскопически в коже животных в первые трое суток после УФО развивается морфологическая картина острого воспаления. Спустя 2 часа эти изменения минимальны и характеризуются слабо выраженными экссудативными изменениями. Спустя 4 часа гистологические изменения возрастают. Появляются апоптозно изменённые кератиноциты (sunburn cells). К 3 суткам гистопатологические изменения сохраняются и достигают максимальной выраженности. В пост-эритемный период (8 суток) в коже сохраняются пролиферативно-гиперпластические и дегенеративные изменения, в том числе дистрофического характера. Пролонгированный характер выявленных в коже изменений свидетельствует о хронизации воспалительного процесса в коже у животных, подвергшихся УФО-облучению.

რეზიუმე

ულტრაიისფერი დასხივების გავლენა ზღვის გოჭის კანის მორფოფუნქციურ მდგომარეობაზე

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კვლევის მიზანს წარმოადგენდა ულტრაიისფერი დასხივების ზემოქმედების შეფასება ზღვის გოჭების კანის მორფოფუნქციურ მდგომარეობაზე. კვლევა ჩატარდა 400-500 გრ წონის 30 გოჭ-ალბინოსზე, რომლებზეც განხორციელდა ლოკალური ულტრაიისფერი დასხივება. კანის ჰისტოლოგიური და ჰისტოქიმიური კვლევა

ჩატარდა ექსპერიმენტის სხვადასხვა ვადაზე (2 საათი, 4 საათი, 3 დღე-ღამე და 8 დღე-ღამე დასხივების შემდეგ). მიკროსკოპულმა გამოკვლევამ ულტრაიისფერი დასხივების 3 დღე-ღამის შემდეგ ცხოველების კანში გამოავლინა მწვავე ანთების მორფოლოგიური სურათი. აღნიშნული ცვლილებები ექსპერიმენტიდან 2 საათის შემდეგ იყო მინიმალური და ხასიათდებოდა უმნიშვნელო ექსუდაციური ცვლილებით; 4 საათის შემდეგ ჰისტოლოგიურმა ცვლილებებმა იმატა, გამოჩნდა აპოპტოზურად შეცვლილი კერატინოციტები (sunburn cells). აღნიშნული ცვლილებები მაქსიმალურად გამოვლინდა მე-3 დღე-ღამეს. პოსტ-ერიტემულ პერიოდში (მე-8 დღე-ღამე) კანში შენარჩუნებულია პროლიფერაციულ-ჰიპერპლაზიური და დეგენერაციული ცვლილებები, მათ შორის - დისტროფიული ხასიათის. გამოვლენილი ცვლილებების პროლონგირებული ხასიათი მიუთითებს ანთებითი პროცესის ქრონიზაციაზე ცხოველების კანში ულტრაიისფერი დასხივების შემდეგ.

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