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Реферати

ВЛИЯНИЕ 1% ЭФИРА МЕТАКРИЛОВОЙ КИСЛОТЫ И ФУЛЛЕРЕНА С60 НА МОРФОФУНКЦИОНАЛЬНОЕ СОСТОЯНИЕ ПЕЧЕНИ КРЫС

Силенко Б.Ю., Силенко Ю.И., Ерошенко Г.А.

В работе изучено влияние фуллерена С60 как потенциального гепатопротектора на структурную организацию печени крыс по сравнению с мономером для пластмасс горячей полимеризации. Установлено, что длительное поступление остаточного мономера из базиса акриловых протезов вызывает дистрофические изменения гепатоцитов и расстройства гемомикроциркуляции в печени крыс.

Применение фуллеренов 60 на фоне действия 1% эфира метакриловой кислоты уменьшает дистрофические изменения в гепатоцитах и дисциркуляторные проявления в печеночных дольках, поэтому может рассматриваться на перспективу в качестве протектора органов пищеварительной системы при пользовании полными и частичными съемными протезами.

Ключевые слова: фуллерен С60, эфир метакриловой кислоты, печень, крысы.

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INFLUENCE OF 1% METACYRIC ACID ETHER AND FULLERENE C60 ON THE MORPHOFUNCTIONAL STATUS OF THE RATS' LIVER

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In the work the effect of fullerene C60 as a potential hepatoprotector on the structural organization of the liver of rats was studied in comparison with the monomer for hot polymerization plastics. It was found that the long-term supply of residual monomer from the base of acrylic prostheses causes dystrophic changes in hepatocytes and disorders of hemomicrocirculation in the liver of rats.

The use of fullerenes 60 against the background of the action of 1% methacrylic acid ester reduces dystrophic changes in hepatocytes and discirculatory manifestations in the hepatic lobules, therefore, it can be considered as a protector of the digestive system when using full and partial dentures.

Key words: fullerene C60, methacrylic acid ester, liver, rats.

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DETERMINATION OF THE FACTORS OF LOCAL HOST DEFENSE IN THE HUMAN SPHENOIDAL SINUS MUCOSA

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The paper was aimed at the study of the mechanisms of the local immunity in the sphenoidal sinus mucosa. The paper presents the authentic immunohistochemical studies on the morphology of the local host defense in the human sphenoidal sinus mucosa. The study material was obtained during the post mortem dissection of individuals died for the reasons not associated with the ENT- pathology. Monoclonal antibodies to specific markers of T- and B-lymphocytes were used for immunohistochemical study. The study has established that the immune response in the human sphenoidal sinus mucosa is represented by the cellular and humoral aspects of the immunity, which are located mainly in the submucous layer, scattered by individual elements and around the microvessels. In addition, moderate CD3 expression in the cytoplasm of short and long intercalate cells and apical surfaces of microvillous cells was revealed, which requires follow-up study and is the prospect of our further research.

Keywords: sphenoidal sinus, mucous membrane, local host defense, T-lymphocytes, B-lymphocytes.

The paper has been written within the RSW, entitled "Determination of the regularities of morphogenesis of organs, tissues and vascular nervous formations of the body in normal conditions, experiment and under the influence of exogenous factors. Morphoexperimental substantiation of the effect of the novel suture materials when used in clinical practice"; State registration number 0113U0010024.

The sphenoidal sinus, along with other paranasal sinuses and nasal cavity, forms a uniform system of air cavities, which provides air conditioning for inhaled air, i.e., cleaning, disinfection, thermoregulation and humidification [2, 3, 9].

The mucous membrane, consisting of pseudostratified ciliated epithelium, stroma, glandular apparatus and neurovascular elements, plays a key role in the performance of these functions. Regardless the uniformity of the structure, the mucous membranes of the various paranasal sinuses possesses its own structural and functional peculiarities [8].

Currently, the study of factors of local immunosurveillance is of great concern [1, 3, 10]. However, publications on this issue in relation to the mucous membrane that covers the sphenoidal sinus, are fragmentary in nature and do not give a clear idea of the structure and morphological features of local immunity of the pseudostratified ciliated columnar epithelium of the sinus.

Thus, the above circumstances determine the relevance and appropriateness of further studying the structural organization and morphological features of the human sphenoidal sinus mucosa with regard to the factors that maintain tissue homeostasis in its mucous membrane.

The purpose of the work was at the qualitative immunohistochemical analysis of the expression of CD3 and CD20 markers in the human sphenoidal sinus mucosa.

Material and Methods. Mucous membrane of the sphenoidal sinus of 30 individuals, died for the reasons not associated with the ENT- pathology, have been studied. The specimens of the sphenoidal sinus mucosa were taken at the forensic morgue of Poltava Regional Bureau of Autopsy. To obtain the mucous membrane samples the access to sphenoidal sinus was made using the method suggested by Abrikosov A.I (1948). Subsequently, the obtained material was embedded into paraffin according to the conventional technique.

Paraffin blocks of the human sphenoidal sinus mucosa were used for the immunohistochemical study. Sections were obtained by the microtome equipped with the section receiving tray (Microm HM-340) to prepare serial sections. In our study, sections of 4-6 μm thick were applied to special SuperFrost Plus adhesive slides and then deparaffined in compliance with the conventional standards.

Pan-T-marker (clone SP7, LabVision) monoclonal antibodies to CD3 and pan-B-lymphocytes (clone L26, LabVision) monoclonal antibodies to CD20 were used as primary ones in our study. Identification of the reaction was carried out by chromogen (DAB (Lab Vision) application under microscope control for 20 seconds to 3 minutes, with the manifestation of the dark brown color of the nuclei of specific structures.

To differentiate the structures of the tissues, the sections were additionally stained with Mayer's hematoxylin for 1-3 minutes. The next dehydration and embedment into the balm was made according to conventional technique. Microscopy was made using the light microscope Leica DMLS with objectives ×40, ×100.

Results and Discussion. The findings of the study showed that loose connective tissue of the lamina propria of the sphenoidal sinus mucosa contains a large number of T- and B-lymphocytes. The T-lymphocytes to B-lymphocytes ratio is 3:1. The T-cell lymphocyte cell membrane contains CD3 and T-cell receptor (TCR) molecules [3, 6]. CD3 is a membrane polypeptide complex, which provides the transmission of antigenic information inside the cell.

The T-lymphocytes are located subepithelially near the basement membrane and around the intramural glands. In addition, a small part of the lymphocytes is within the epithelial lining, and sometimes on the surface of the mucous membrane [2, 5, 10]. Poor response of the intraepithelial T-lymphocytes to CD3 marker stimulation was detected. Presumably, their function is to eliminate mutant or infected epithelial cells.

It was established that in the sphenoidal sinus mucosa T-lymphocytes, presented in the form of clusters of lymphoid cells, are more closely located near the microvessels of the lamina propria (Fig. 1). They are orbicular with nuclei of different sizes. Notably, in the epithelial layer, short and long intercalated cells are well expressed by the CD3marker, coloring light brown.

At the same time, high expression to the CD3 marker is observed on the apical surface of the microvillous cells, whereas no expression to CD3 in highly differentiated epithelial cells has been noted (Fig. 2).

The findings of the immunohistochemical study have revealed, sub-epithelially, single-scattered CD20-positive cells in the sphenoidal sinus mucosa; small clusters of these cells have been found perivascularly in the lamina propria.

Such lymphoid cellular infiltrates in the upper respiratory tract mucosa are known as MALT (mucosa associated lymphoid tissue). Our own immunohistochemical studies indicate that these lymphoid cellular clusters are represented by predominantly B-lymphocytes, and their derivatives,

namely, plasmacytes and single labrocytes. Nuclei of plasmocytes are eccentric, and their cytoplasm contains light brown granules.

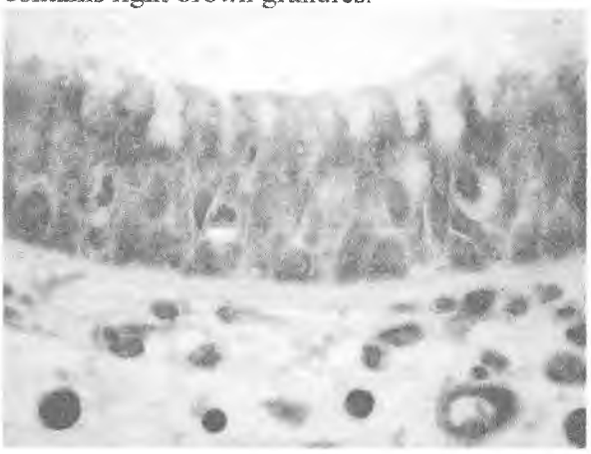

Fig. 1. Human sphenoidal sinus mucosa. Strong expression of the CD3 marker in T-lymphocytes and around the vessels and moderate expression in the intercalated cells. CD3 stain. Microimage: obj.lens: × 100; ocular lens: × 10.

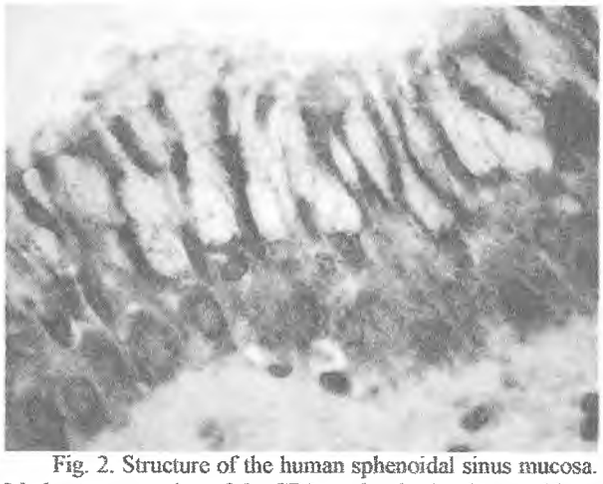

Fig. 2. Structure of the human sphenoidal sinus mucosa. Moderate expression of the CD3 marker in the short and long intercalated cells and apical surfaces of the microvillous cells. CD3 stain. Microimage: obj.lens: × 100; ocular lens: × 10.

Labrocytes are larger in size, and dark brown granules are found in the cytoplasm. No expression to CD20 has been detected in the epithelial layer cells (Fig. 3).

Fig. 3. Sphenoidal sinus mucosa. Moderate expression of CD20 marker in the connective tissue cells of the lamina propria. CD20 stain. Microimage: obj.lens: × 20; ocular lens: × 10.

Based on the ability of individual epithelial cells to express CD3, we hypothesize that microvillous cells are capable of capturing and processing antigens, thus, performing an antigen-presenting function similar to dendritic Langerhans cells.

Supposedly, intercalated cells have the ability to control the processes of proliferation of the basal cells and provide presentation of antigen to T-lymphocytes, which are located in the lamina propria of the upper respiratory tract mucosa.

This is concurred with the opinion of V.P. Bykova (1993, 2009), who asserts that some epithelial cells of the respiratory tract are capable of capturing and transferring an antigen [3, 8, 9].

The author reports that the cells of the non-ciliated respiratory epithelium have a tubular-vesicular structure in the cytoplasm, contain molecules of the main complex of HLA class II histocompatibility on the cell membrane and are capable of expressing certain antigens and, thus, can initiate the immune response.

Thus, the findings of the study enable to consider the cells of the immunological series of the mucous membrane of the sphenoidal sinus as part of the bronchoassociated lymphoid tissue. It is completely in concordance with the publications of other scholars [2, 4, 5, 7].

Dovbnya Yu.M., Pronina Ye.N., Yeroshenko G.A. (2017) report that the study of the sections of the mucous membrane of the human frontal sinus has found that the cells of the leukocytic series are determined both perivascularly (cluster of lymphocytes, macrophages and plasmocytes), and in the structure of the stromal cells of the glands [4, 5].

Conclusions

CD3 expression is characteristic to T-lymphocytes, short and long intercalated cells and apical surfaces of microvillous cells of the pseudostratified ciliated columnar epithelium of the sphenoidal sinus. The humoral link of the immune response is represented by B-lymphocytes and plasmocytes, which are located sporadically and perivascularly in the submucous connective tissue layer.

Perspectives of further research will encompass the study of morphometric and ultrastructural parameters of the immunocompetent cells and their correlations with epithelial, mesenchymal structures of the human sphenoidal sinus mucosa.

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Реферати

ВИЗНАЧЕННЯ ФАКТОРІВ МІСЦЕВОГО ЗАХИСТУ СЛИЗОВОЇ ОБОЛОНКИ КЛИНОПОДІБНОЇ ПАЗУХИ ЛЮДИНИ

Совгиря С.М.

Мета дослідження – вивчення механізмів місцевого захисту слизової оболонки клиноподібної пазухи. В статті представлені оригінальні імуногістохімічні дослідження, присвячені вивченню морфології місцевого імунного захисту в слизовій оболонці клиноподібного синуса людини.

Матеріал для дослідження отримали під час секційного розтину осіб, що померли від захворювань не пов'язаних з ЛОР патологією. Для імуногістохімічного дослідження використовували моноклональні антитіла до специфічних маркерів Т- і В-лімфоцитів.

В ході дослідження встановлено, імунна відповідь в слизовій оболонці клиноподібної пазухи людини представлена клітинною та гуморальною ланками імунітету, які розташовуються переважно в підслизовій основі поодиноко та поблизу мікросудин.

Крім того, була виявлена помірна CD3-експресія в цитоплазмі коротких і довгих вставних клітин та апікальні поверхні мікровійчастих клітин, що потребує подальшого вивчення і являється перспективою наших подальших досліджень.

Ключові слова: клиноподібна пазуха,слизова оболонка, місцевий статус, Т-лімфоцити, В-лімфоцити.

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ОПРЕДЕЛЕНИЕ ФАКТОРОВ МЕСТНОЙ ЗАЩИТЫ СЛИЗИСТОЙ ОБОЛОЧКИ КЛИНОВИДНОЙ ПАЗУХИ ЧЕЛОВЕКА

Совгиря С.Н.

Цель исследования - изучение механизмов местной защиты слизистой оболочки клиновидной пазухи. В статье представлены оригинальные иммуногистохимические исследования, посвященные изучению морфологии местной иммунной защиты в слизистой оболочке клиновидного синуса человека.

Материал для исследования получили во время секционного вскрытия лиц, что умерли от заболеваний несвязанных с ЛОР патологией. Для иммуногистохимического исследования использовали моноклональные антитела к специфическим маркерам Т- и В-лимфоцитов.

В ходе исследования установлено, что иммунный ответ в слизистой оболочке клиновидной пазухи человека представлен клеточным и гуморальным звеньями иммунитета, которые располагаются в основном в подслизистой основе рассеянно единичными элементами и вокруг микрососудов.

Кроме того, была выявлена умеренная CD3-экспрессия в цитоплазме коротких и длинных вставных клеток и апикальные поверхности микроворсинчастых клеток, что требует дальнейшего изучения и является перспективой наших дальнейших исследований.

Ключевые слова: клиновидная пазуха, слизистая оболочка, местная защита, Т-лимфоциты, В-лимфоциты.

Рецензент Єрошенко Г.А.