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INVOLVEMENT OF SKIN CELLULAR STRUCTURES IN IMMUNE PROCESSES

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ABOUT ARTICLE

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Abstract: The skin is the largest organ of the human body. The unique role of the skin is that it serves as a barrier between the body and the environment. The skin consists of 2 inseparable layers: the epidermis and the dermis, represented by a large number of cell types and auxiliary structures, each of which has its own significance. The protective function of the skin is the ability to participate in maintaining homeostasis by regulating moisture evaporation, maintaining body temperature, preventing the penetration of microorganisms and chemicals, developing an immune response to drugs capable of penetrating mechanical barriers, and, ultimately, in the formation of pigments and keratin to protect against sunlight.

INTRODUCTION

Materials and methods of research. The skin is an important part of the immune system and can be considered primarily as a borderline organ of immune protection. It is the skin that often comes into first contact with various pathogens and viruses, fungi and protozoa. If the skin is able to fully perform its barrier function, then the internal environment of the body is preserved. If, as a result of any impact, the protective functions and integrity of the skin are violated, the body finds itself in a critical situation, for example, with burns of large areas of the skin. The mechanism of immune protection, including skin, can be divided into 2 types: with the participation of innate immunity and with the participation of acquired (adaptive) immunity. The first and most important protective function of the skin is related to

innate immunity. The most differentiated layer of the epidermis is the stratum corneum, which is the first to come into contact with the environment. This physical barrier consists of extracellular lipids and keratinized cells and is permeable only to water and some small molecules. Some lipid components isolated from the stratum corneum (sebaceous lipids, sphinolipids, free fatty acids) have antibacterial activity. The permanent microflora of the skin also suppresses the growth of pathogenic microorganisms. As for acquired immunity, the skin has a full set of immune defense mechanisms. This type of immune response is antigen-specific and is associated with the function of immunological memory. The components of this system are Langerhans cells and other antigen-presenting cells, habitable and mobile lymphocytes, as well as endothelial cells, which together form this complex, called "lymphoid tissue related to the skin", by analogy with conjunctiva, bronchi and lymphoid tissue related to the stomach. The skin has the ability to trigger a full-fledged immune response. The main antigen-presenting skin cells are Langerhans cells. In appearance, they resemble tennis rackets and contain characteristic cytoplasmic organelles called Bilbeck granules. Their role is to recognize and express antigens. These cells are obtained from the bone marrow, but they penetrate into the epidermis of the fetus already in the first trimester of pregnancy, and then during pregnancy their number increases. In adults, they make up 2-8% of all epidermal cells. In addition, Langerhans cells contain a large number of cell surface antigens and membrane-bound proteins. Langerhans cells are unstable, but, on the contrary, they are very dynamic, penetrating into and leaving the epidermal layer, changing the surface phenotype, localization and maturity. Their main function is to present antigens to naive T cells of the epidermis, where the immune response begins. Other antigen-presenting cells of the skin and local lymph nodes include dermal dendrites (in the skin layer), follicular dendritic cells (in the lymph nodes), monocytes, macrophages and B cells. Lymphocytes circulating in healthy skin - all extravascular T-cell type lymphocytes - are an integral part of the skin's immune system. The perivascular and perianal areas of the dermis contain 90% of T-lymphocytes. Most skin lymphocytes are in an activated state.

The results of the study and their discussion. The migration process between peripheral blood and skin is regulated by cell adhesion molecules on the surface of lymphocytes, endothelial cells and keratinocytes. Keratinocytes are the most numerous cells of the epidermis. They are not only structural components, but also immunologically active. Keratinocytes may play an important role in initiating cell-mediated immune responses in the skin through the release of interleukins and the expression of adhesion molecules. Activated keratinocytes can also affect the entry and exit of lymphocytes and other motile immune cells into and out of the skin. Mast cells, eosinophils and basophils are also present in the skin. They are involved in the immune response of the skin in various inflammatory skin diseases and are found in foci of malignant degeneration. Once in a sensitized organism, allergens reach the place

of concentration of mast cells and, in contact with them, cause their activation and degranulation. As a result, a number of enzymes, inflammatory mediators and chemokine factors are released, which attract other effector cells, especially basophils and eosinophils. When mast cells are degranulated, the content of eosinophils in the skin increases, which leads to allergic reactions. Eosinophils capture histamine and destroy it with the help of histamine enzymes, and are also involved in the destruction of toxins of protein origin, foreign proteins and immune complexes. Melanocytes are also actively involved in the immune response of the skin. Like keratinocytes, these pigment-producing cells synthesize various biologically active compounds that act as mediators of inflammatory processes in the skin and epidermis.

CONCLUSION

Thus, the skin is the largest special organ. In particular, the skin, like the thymus gland, is a barrier organ in which certain types of immune cells mature and immunological reactions occur. The skin barrier contains all types of cells capable of carrying out a wide range of immune responses.

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