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IMMUNOLOGICAL INDICATORS IN ACTINIC KERATOSIS

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Abstract
The article discusses modern information on actinic keratosis, presents generalized data from scientific studies of immunological studies of the disease.

Keywords: actinic keratosis; solar keratosis; senile keratosis; precancerous skin lesion; squamous cell carcinoma in situ; solar irradiation; ultraviolet light; interleukini, IL-4, IL-10, TNF.

Introduction

One of the important areas of modern medicine, working at the intersection with molecular biology, is the study of the role of cytokines and interferons in the pathogenesis of the development and progression of diseases, especially those prone to cancer. The world covers multifaceted aspects of the study of cytokines in immunodeficiency states, especially secondary immunodeficiencies. Among the urgent problems is the study of the main cytokines of the immune system, which are important in the immunopathogenesis and course of actinic keratosis.

Thus, below we present cytokines that provide the functions of intercellular cooperation, positive and negative immunoregulation of the body's protective functions. Also regulating the processes of amplitude and duration of inflammatory, immune responses and immunosuppression. Despite the significant deepening of ideas in the etiology, immunopathogenesis, course and progression of various forms of actinic keratosis in the last decade, questions regarding the mechanisms of the development of the pathological process and its progression remain open.

The main cytokines of the immune system, the importance of which is important in the development of actinic keratosis, are described below. Thus, we studied the main pro- and anti-inflammatory cytokines TNF-α, IL-4 and IL-10 in AA, which are pro-inflammatory and anti-inflammatory mediators in nature. The analysis is presented in Table 1.1 below. A comparative analysis revealed a significant increase in the pronounced pro-inflammatory cytokine TNF-alpha compared to the control normative values. Thus, the level of TNF-alpha in the peripheral blood serum was increased by 5.7 times in relation to the standard values ($P<0.001$). This is a fairly very high difference from the norm. TNF-alpha is known to be a pronounced pro-inflammatory cytokine that supports inflammation through the production of innate immunity by cells.

Table 1.1. COMPARATIVE CHARACTERISTICS OF CYTOKINES IN AC,
M±m, pg/ml

Group	TNF-α	IL-4	IL-10
AC patients	25.82±3.34*	9.54±1.42*	23.18±1.54*
Control	4,54±0,62	3.27±0.42	3.18±0.63

Note: * - the differences in the data of the control group are significant

It is known from the literature that an increase in pro-inflammatory cytokines often has a damaging effect in tissues and in the organ. In this case, it is an area of damaged skin.

Next, we analyzed the level of IL-4 in the blood serum of patients with AC. The analysis showed that the level of IL-4 in the blood was also increased by 2.9 times in relation to the standard values. It follows that we observe not only an increase in pro-inflammatory cytokines, but also anti-inflammatory, the study of which has an important diagnostic and prognostic value.

As for anti-inflammatory cytokines, it should be said that the normal functioning of the immune system is based on the balance of TX1 and TX2 lymphocytes. So, TX2 lymphocytes secrete IL-4, IL-5, IL-10 and other cytokines that stimulate mainly the humoral link of immunity. In turn, IL-4 participates in the differentiation of T-helper cells and under the influence of IL-4, B-lymphocytes switch to the synthesis of immunoglobulins. For example, IL-4 enhances differentiation into cytotoxic T cells, activates macrophages, enhancing their cytotoxic potential, and induces ECC proliferation, which is important in the pathogenesis of AA. It is known that the main producers of IL-4 are CD4+ and CD8+ lymphocytes, B-lymphocytes and macrophages. Therefore, IL-4 is the main product of TX2 cells and stimulates their differentiation. It determines the proliferation and differentiation of B and T lymphocytes, affects the development of hematopoietic cells, macrophages, ECC cells, basophils, being a functional twin or antagonist of cytokines produced by TX1 cells.

IL-10 is also produced by TX2, monocytes, macrophages and has a broad spectrum of action with a pronounced immunosuppressive effect. According to the literature, the anti-inflammatory activity of IL-10 is manifested by the ability to suppress the production of pro-inflammatory cytokines, increase the production of the IL-1 receptor antagonist, and reduce the adhesion of leukocytes to endothelial cells. Like IL-4, IL-10 contributes to the development of the humoral component of the immune response, causing immunosuppressive reactivity of the body. IL-10 serves as the most important regulator of the immune response, suppressing the activity of macrophages and TX1 cells and ensuring the implementation of some biological effects of TX2.

As for IL-10, we also see a significant increase in this cytokine in the peripheral blood serum of patients by 7.3 times when compared with the data of the control group. Thus, it can be seen from the table that IL-10 was also significantly increased, which once again confirms the pathogenesis and nature of this pathology. We can confidently talk about autoimmunization, which is observed in AC.

Of course, the observed activation of the inflammatory process indicates the duration of the pathological process and the depletion of the pro-inflammatory potential, which entails the launch of the autoimmunization mechanism.

It is known that the cytokine TNF-α is of cellular origin, that is, it is produced mainly by cells of the immune system and is the product of monocytes/macrophages, in special cases - activated T-lymphocytes. Consequently, the latter are the main producers of TNF-alpha. It is obvious that TNF-α is involved in the implementation of the cytotoxic effect of natural killer cells, which play an important role in antitumor protection. However, sometimes such a picture itself can contribute to the transition from inflammation to carcinogenesis.

TNF-alpha is a cytokine, which, in terms of its properties and spectrum of biological action, is a product of macrophages of T-lymphocytes themselves. TNF-alpha values contribute to the suppression of cellular parameters of immunity and the maintenance of the inflammatory process.

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Thus, the data obtained by us on the study of TNF-alpha, IL-4 and IL-10 indicate the important diagnostic value of determining the studied cytokines in AA. Imbalance in the production of cytokines entails an important role in the immunopathogenesis, chronicity and progression of the inflammatory process. All of the above and the results revealed during the study indicate a clear imbalance in the state of the immune system. Although TNF-α is one of the most well-known and widely studied pro-inflammatory cytokines, despite this, the data obtained by us are of primary importance in this area, therefore there are practically no such studies in the literature. It is also important to note that excess pro-inflammatory cytokines such as TNF-α contribute to the maintenance of a long-term inflammatory process in the tissue and may contribute to increased damage.

Next, we looked at the ratios of cytokines that are of important diagnostic importance. Normally, the TNF-alpha/IL-4 ratio was 1.4 and the TNF-alpha/IL-10 ratio was 1.4. And in the pathological process of AC: TNF-alpha/IL-4 was 2.7, and TNF-alpha/IL-10 was 1.1. It can be seen from the data obtained that the TNF-alpha to IL-4 ratio in AK was increased by almost 2 times, which indicates activation and pronounced inflammation against the background of immunosuppression, that is, pronounced immunodeficiency.

As for the ratio of TNF-alpha to IL-10, the norm is 1.4, and in the case of AA pathology it is 1.1, that is, the ratio decreases, which indicates autoimmunization of the body. It follows that thanks to the analysis of ratios, we can interpret the fact that there is a pronounced autoimmunization and immunosuppression in AA. It is known that immunosuppression leads to carcinogenesis of the process.

Thus, the results of the study obtained by us show that the study of the main cytokines is important not only in the diagnosis of the disease, and the immunological aspects studied by us can serve as markers of disease progression and in the future these markers can become targets for disease therapy. Thus, pronounced autoimmunization and suppression of immunity in patients with AC were revealed, which will serve as a basis for optimizing therapy. Therefore, the changes in the content of cytokines identified by us are diagnostic in nature with the further possibility of selecting targeted therapy.

In conclusion, patients with AA are characterized by a decrease in the content of TNF-alpha in the peripheral blood serum by 4.7 times in relation to the standard values, the content of IL-4 in the blood by 2.9 times in relation to the norm, and the content of IL-10 in the blood of patients by 7.3 times when compared with the control data. Consequently, we observe a pronounced immunosuppression of the body due to the suppression of IL-10, which is a pronounced suppressive cytokine. The severity of these changes differs depending on age and the severity of the disease.

References:

1. Н.М.Аюбова, Б.С.Азизов. Современный взгляд на проблему актинического кератоза//. Центральноазиатский научно практический журнал «Новости дерматовенерологии и репродуктивного здоровья №3.2023 [103]. 78-81 стр. ISSN 2091- 5969.
2. Н.М.Аюбова, Ozbekiston Respublikasida aktinik keratozning turli shakllarining klinikada uchrashi//. Центральноазиатский научно практический журнал. Новости дерматовенерологии и репродуктивного здоровья №4.2023 [104]. 32-33 стр. ISSN 2091-5969.
3.

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4. Молочков В. А., Молочков А. В. Клиническая дерматоонкология. М.: Из-во студия МДВ, 2011. 340 с., илл., табл. с. 74, 75. Molochkov V. A., Molochkov A. V. Klinicheskaya dermatoonkologiya. M.: Iz-vo studiya MDV, 2011. 340 s., ill., tabl. s. 74, 75.

5. Claudia Costa, Massimiliano Scalvenzi, Fabio Ayala, Gabriella Fabbrocini, Giuseppe Monfrecola. How to treat actinic keratosis. An update. Department of Dermatology, Federico II University, Naples, Italy. J Dermatol Case Rep 2015; 2: pp 29—35.

6. Annabel Dodds, Alvin Chia, Stephen Shumack. Actinic Keratosis: Rationale and Management. Dermatol Ther (Heidelb) 2014; 4: 11—31.

7. Traianou A., M. Ulrich, Z. Apalla, E. De Vries, K. Bakirtzi, D. Kalabalikis, L. Ferrandiz, A. Ruizde-Casas, D. Moreno-Ramirez, D. Sotiriadis, D. Ioannides, S. Aquilina, C. Apap, R. Micallef, L. Scerri, S. Pitkanen,O. Saksela, E. Altsitsiadis, B. Hinrichs, C. Magnoni, C. Fiorentini, S. Majewski, A.Ranki,C.M. Proby,E, Stockfleth and M. Trakatelli on behalf of the EPIDERM Group. Risk factors for actinic keratosis in eight European centres: a case–control study, British Association of Dermatologists 2012; 167 (Suppl. 2), pp 36—42.

8. Marina Câmara de Oliveira, Flávia Trevisan, Clovis Antônio Lopes Pinto, Célia Antônia Xavier, Jaqueline Campoi Calvo Lopes Pinto. Histopathological analysis of the therapeutic response to cryotherapy with liquid nitrogen in patients with multiple actinic keratosis. An Bras Dermatol 2015; 90 (3): 384—9.

9. Caterina Longo, Stefania Borsari, Elisa Benati, Elvira Moscarella, Roberto Alfano, Giuseppe Argenziano. Dermoscopy and Reflectance Confocal Microscopy or Monitoring the Treatment of Actinic Keratosis with Ingenol Mebutate Gel: Report of Two Cases. Dermatol Ther (Heidelb) 2016; 6: 81—87.

10. Ketty Peris, Tamara Micantonio, Domenico Piccolo, Maria Concetta Fargnoli Dermoscopic features of actinic keratosis Department of Dermatology,University of L'Aquila, L'Aquila, Italy JDDG; 2007; 5: 970—976.

11. Thomas D. Butler, Rubeta N. Matin, Andrew G. Affleck, Colin J.Fleming, Jonathan C. Bowling. Trends in dermoscopy use in the UK: results from surveys in 2003 and 2012. Dermatol Pract Concept 2015; 5 (2): 4.