STUDY OF INDICATORS OF SYSTEMIC INFLAMMATION IN PATIENTS WITH PSORIASIS WITH CONCOMITANT ALIMENTARY OBESITY

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Psoriasis is one of the most common chronic recurrent systemic autoimmune multifactorial diseases, which is characterized by the involvement of the skin, joints and internal organs in the pathological process. According to the results of clinical and epidemiological studies, psoriasis affects about 4 % of the population of our planet, regardless of sex, age and ethnic group [1]. The causes of psoriasis are immunological disorders and genetic defects. However, despite the significant prevalence of psoriasis and a large number of studies on this problem, there is still no single view on the pathogenesis of this dermatosis, which is associated with insufficiently studied comorbidity of the disease [2].

Recently, there has been a steady trend of increased comorbidity of psoriasis and obesity. Obesity develops due to disorders of metabolism and eating behavior. It is characterized by the accumulation of adipose tissue in the body. Obesity can be both an independent multifactorial disease – primary obesity (alimentary and constitutional), and a syndrome that accompanies the course of other diseases – secondary obesity (symptomatic). In the structure of morbidity, primary obesity occurs in 95 % of patients, secondary – only in 5 % [3]. A person is considered obese if his/her body mass index (BMI) exceeds 30 kg/m2. The causes of psoriasis and abdominal obesity are immunological disorders and genetic defects. Recent studies have found that systemic inflammation is a common link in the pathogenesis of obesity and psoriasis.

The aim of the research to investigate the indicators of systemic inflammation in patients with moderate vulgar psoriasis of moderate severity, progressive stage of the course and concomitant alimentary obesity of I-II degree.

Materials and methods. Extensive psoriasis vulgaris, progressive stage, moderate severity, and concomitant grade I-II alimentary obesity were diagnosed in 20 examined patients; the study group included 12 (60 %) men and 8 (40 %) women aged from 35 to 65 years.

Psoriatic lesions were of extensive nature in all patients. When determining the number of recurrences of psoriasis per year, we found that it was observed 2 times a year in 2 (10 %) patients, 3 times a year in 12 (60 %) patients and 4 times a year in 5 (25 %) patients. The PASI (Psoriatic Area and Severity Index) was used to assess the severity of psoriasis [4]. To assess the severity of alimentary obesity in the examined patients, we determined body mass index (BMI) [5]. Subjects with a BMI of 30-40 kg/m2 were included in the study.

To assess the severity of systemic inflammation (SI) in the serum of patients, we determined the concentration of interleukin-33 (IL-33), interleukin-6 (IL-6) and high sensitive C-reactive protein (hs-CRP) by enzyme-linked immunosorbent assay on a multichannel photometer “STATFAX-303” (USA). For quantification of indicators, we used commercial test systems “interleukin-6-ELISA-BEST” (Russia), “CRP-ELISA-BEST” (Russia), “Human IL-33 ELISA Kit” “eBioscience™/Affymetrix” (USA) according to the recommended methods. The obtained indicators were compared with those of the reference values recommended by the manufacturers of diagnostic test systems.

Results of the study and their discussion. Alimentary obesity was observed in all patients of the study group. When calculating BMI and analyzing indicators in accordance with the classification of obesity by BMI, it was found that 7 (35 %) patients had grade I obesity, whereas 13 (65 %) patients had grade II obesity. The average group BMI was 36.7±1.8 kg/m². Based on an objective examination of the clinical presentation, the average PASI index was calculated. It was (21.8±1.4), which corresponds to the average severity of psoriasis. In the study of systemic inflammation, the mean group values of hs-CRP, IL-33 and IL-6 were calculated. In the analysis of the obtained results, it was found that all patients presented with an increased hs-CRP (13.99±2.98 IU/l), IL-33 (73.69±7.5 pg/ml), and IL-6 (13.01±1.54 pg/ml), which indicates the presence of a systemic inflammatory process in all examined subjects (table 1).

Table 1. Indicators of systemic inflammation in patients with extensive psoriasis of moderate severity and concomitant grade I-II alimentary obesity (M±m), n=20

Index	Value	Reference value
IL-33, pg/ml	73.63±6.5	0-54.8
IL-6, pg/ml	12.9±1.45	0-10
hs-CRP, IU/l	13.43±1.28	0.068-8.2

Analyzing the results, it should be taken into account that excess fat deposition is not only an accumulation of excessive fat cells overloaded with triglycerides, but also an important element of the endocrine system, which possesses endo-, auto- and paracrine functions that cause subclinical inflammation. Obesity causes a mild chronic systemic inflammatory response, which provokes increased insulin resistance through the augmented production of inflammatory mediators by excess fat cells. Moreover, tissues remote from the adipose tissue do not demonstrate a clear inflammatory reaction, but they are exposed to elevated levels of adipokines, which are secreted by activated and hypertrophied adipocytes. IL-33 is known to be expressed in adipose tissue by adipocytes and macrophages, and its production increases with weight gain, reflecting the close link between obesity and inflammation. In turn, IL-33 activates mast cells, basophils, eosinophils and natural killer cells, contributing to inflammatory and autoimmune diseases. In obese patients, low-intensity chronic inflammation can be detected when plasma levels of hs-CRP and inflammatory cytokines such as interleukin-33 (IL-33) and interleukin-6 (IL-6) are elevated. The results of multicenter studies prove a threefold increase in the expression of IL-33 by subcutaneous adipose tissue in obese patients. In psoriasis, IL-33 is released during cell damage to warn the immune system and initiate the inflammatory processes by activating the NF-kB immune response [6, 7, 8]. Adipocytes and macrophages secrete IL-6 in adipose tissue. Determination of arteriovenous cytokine difference showed an increase in its serum concentration, indicating the secretion of IL-6 by adipose tissue, which produces approximately 30 % of circulating IL-6 in the human body. Both leptin and IL-6 production by adipose tissue increase with weight gain. Circulating IL-6 is one of the most important factors determining the production of acute-phase proteins by the liver. It provides a rapid coordinated physiological response to tissue damage or infection, aimed at activating the body's defense mechanisms: the destruction of pathogenic microorganisms, removal of damaged cells and repair of damaged tissues [9]. It should be noted that hs-CRP is one of the most important proteins of the acute phase. It attaches to the membranes of damaged cells and causes their death by activating the reactions of the complement cascade. It is known that hs-CRP is a marker of the IL-6 action [10, 11]. The production of hs-CRP in the liver is regulated by circulating IL-6.

Therefore, it can be argued that this cytokine, whose concentration increases in obesity, significantly contributes to the occurrence of a chronic systemic inflammatory reaction.

Results of the research. The results of the study confirm that a common link in the pathogenesis of psoriasis and obesity is systemic inflammation, which forms a vicious circle at the level of the immune system, complicating the course of this comorbidity, contributing to the development of severe, atypical and resistant to therapy forms of dermatosis.

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