COMPLEX INDICATORS OF GENERAL BLOOD ANALYSIS AS MARKERS OF INFLAMMATION

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ABSTRACT

Increasing the effectiveness of predicting the results of treatment of patients with rosacea is one of the important tasks of modern dermatology. The predictive value of the immunological markers PLR (platelet-lymphocyte ratio), NLR (neutrophil lymphocyte ratio) and SII (systemic immune-inflammation index) in patients with rosacea was studied. The study included 38 patients with rosacea with erythematotelangiectatic and papulopustular subtype of the disease, aged 18 to 63 years. The control group consisted of 20 healthy people. In the compared groups, there was a statistically significant difference in the average platelet volume (PLT), in the ratio of neutrophils and lymphocytes (NLR), platelets and lymphocytes (PLR), as well as in the index of systemic immune inflammation (SII).

Keywords: rosacea, blood inflammation markers

Rosacea is a chronic inflammatory skin condition of the face that mainly affects people with fair skin and usually begins in middle age. In the structure of dermatological pathology, rosacea ranges from 2% to 10% (Adaskevich V.P., 2005). Typical clinical signs include erythema, flushing, telangiectasia, papules and pustules located on the central part of the face. Although the prevalence of rosacea is highest among white populations of Northern European descent, recent studies have shown that rosacea is common in people with a wide range of racial/ethnic backgrounds and skin types. When rosacea appears on darker skin types, diagnosis is often more difficult due to the masking of facial features by increased levels of epidermal melanin. Late diagnosis of the disease is noted due to the difficulty of recognizing erythema and telangiectasia on dark skin. However, studies conducted around the world have shown a correlation between rosacea and factors such as hotter climates and increased sun exposure [1,2,3,16]. The pro-inflammatory effect of ultraviolet radiation on the skin, as well as the presence of demodex mites, cannot be ruled out.

The aim of the study was to examine complete blood count indicators, markers of systemic inflammation and indicators of immunological status in patients with rosacea.

Materials and methods: The study included 38 patients diagnosed with rosacea with erythematotelangiectatic and papulopustular subtypes aged from 19 to 63 years, the average age was 37.5±14.7 years. The control group consisted of 20 healthy people, similar in age and gender. The duration of the disease ranged from 3 months to 16 years.

The study examines the prognostic value of three markers: neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), and systemic immune inflammation index (SII) in rosacea. An intragroup study of these indicators was also carried out for different subtypes of the disease. The study was aimed at establishing the relationship between NLR, PLR, SII and the severity of different subtypes of rosacea. NLR was calculated by dividing the absolute neutrophil count (ANC) by the absolute lymphocyte count (ALC); PLR was calculated by dividing the absolute platelet count (PLT) by the absolute lymphocyte count (ALC). The state of cellular immunity indicators with the identification of CD3+, CD4+, CD8 was also studied. The material for studying the indicators of cellular immunity was the peripheral blood of patients with the study of the above subpopulations.

Study results: according to the classification of rosacea proposed by G. Plewig and A. _ M. _ Kligman (1994), the erythematotelangiectatic subtype was recorded in 16 patients (42.1%), the papulo -pustular subtype - in 20 (52.6%). In addition, 2 patients (5.2%) were diagnosed with a phymatous condition (rhinophyma). Demodex was detected in 24 (63%) patients with rosacea fol. The distribution of patients according to clinical forms of rosacea is presented in Table 1.

Table 1

Sign	Study group (N= 38)	Control group (N= 20)
Age – years	37.5±14.7	35.2±9.1
Male gender – abs (%)	20 (53%)	11 (55%)
Female gender – abs (%)	18 (47%)	9 (45%)
St. localis :		
erythema – abs (%)	38 (100%)	-
t eleangiectasia – abs (%)	34 (89%)	-
n apules – abs (%)	20 (53%)	-
p joints – abs (%)	20 (53%)	-
Rhinophyma – abs (%)	2(5%)	-
L localization :		
cheeks – abs (%)	38 (100%)	-
forehead – abs (%)	20 (53%)	-

wings of the nose – abs (%)	18 (47%)	-
chin– abs (%)	18 (47%)	-
Demodex fol.– abs (%)	24 (63%)	-
Complaints : _		
itching – abs (%)	38 (100%)	-
burning – abs (%)	20 (53%)	-
feeling of tightness – abs (%)	10 (26%)	-
hypersensitivity – abs (%)	10 (26%)	-
Astheno -neurotic syndrome – abs (%)	16(21%)	2 (10%)
Diabetes mellitus – abs (%)	4 (10.5%)	15%)
Mycosis of the feet – abs (%)	4(10.5%)	-
Gastrointestinal tract:		
gastroduodenitis – abs (%)	6 (16%)	2 (10%)
cholecystitis– abs (%)	6 (16%)	-
gastritis – abs (%)	4(10.5%)	2 (10%)

When studying blood parameters, statistically significant differences were revealed (p <0.05) in the following indicators: the total number of platelets (PLT) in the comparison group was higher than in the control group and amounted to 297.7 * 10^{9} / L , the ratio of platelets to lymphocytes (PLR) was 169.4 in the comparison group and 117.5 in the control group, neutrophil to lymphocyte ratio (NLR) - 2.92 in the comparison group and 1.9 in the control group, IgA - 2.43 and 1.7 g /l, IgG - 11.84 and 10.23 g/l, respectively, systemic immune inflammation index (SII) was 925.6. (Fig. 1, 2)
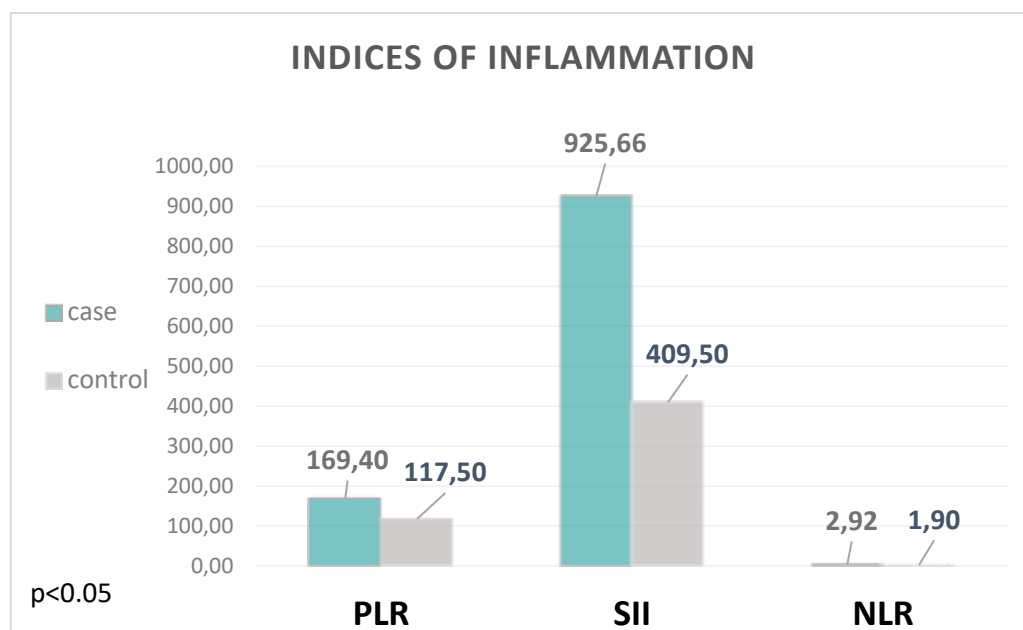

Fig.1 The value of inflammation indices in the study and control groups (**p< 0.05)**

Thus, compared with the control group, the PLT index in patients with rosacea was significantly higher. In addition, the PLR and NLR indices in the group of patients were higher than in healthy people.
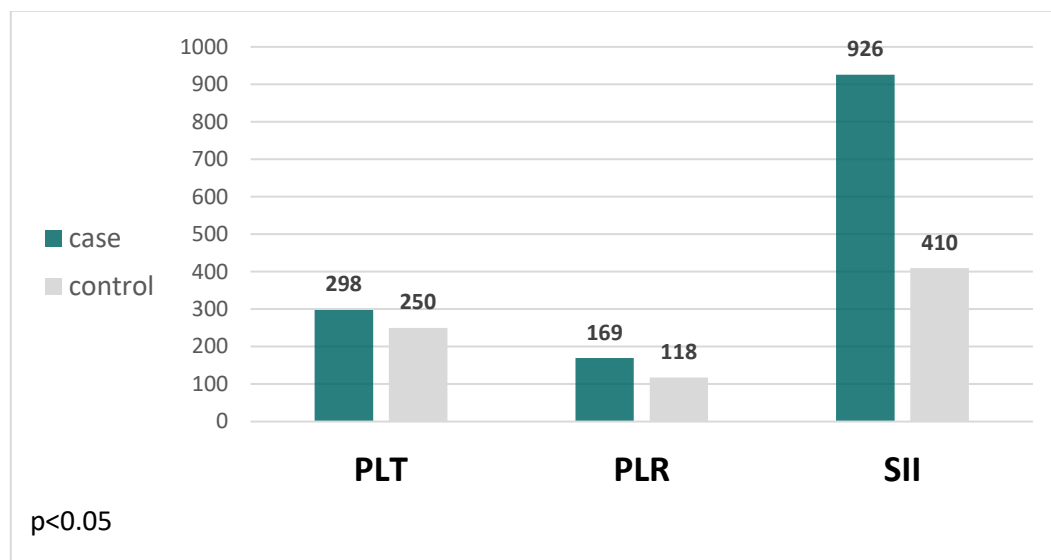

Fig.2 The role of platelets in the pathogenesis of rosacea . Comparison of parameters including platelets in the study group and the control group (**p < 0.05**)

Analysis of the number of cells and determination of the type of CD markers allows characterize the type, strength and nature of the immune response. We studied CD markers of the general population of lymphocytes - T-lymphocytes (CD3+), as well as T -helper cells (CD4+), T-cytotoxic (CD8+), CD4+/CD8+ ratio index.

In the study, patients with rosacea revealed a deficiency in the T-cell immunity, characterized by a decrease in CD3+ and CD4+ cells; on the contrary, an increase in CD8+ cells, both absolute and relative values, was found. The CD4+/CD8+ ratio was lower in the study group - 1.24 relative to the control group - 1.75. Differences in the levels of lymphocytes were also revealed, namely the number of CD3+ in the study group was 50.99 % and turned out to be lower than in the control group - 59.5%. The CD4+ count was similarly lower in the study group - 29.42% than in the control group - 36.5%. On the contrary, the CD8+ count in the study group was higher (24.32%) than in the control group (22%). The IRI was lower in the study group - 1.24 relative to the control group - 1.75. (Fig.3)
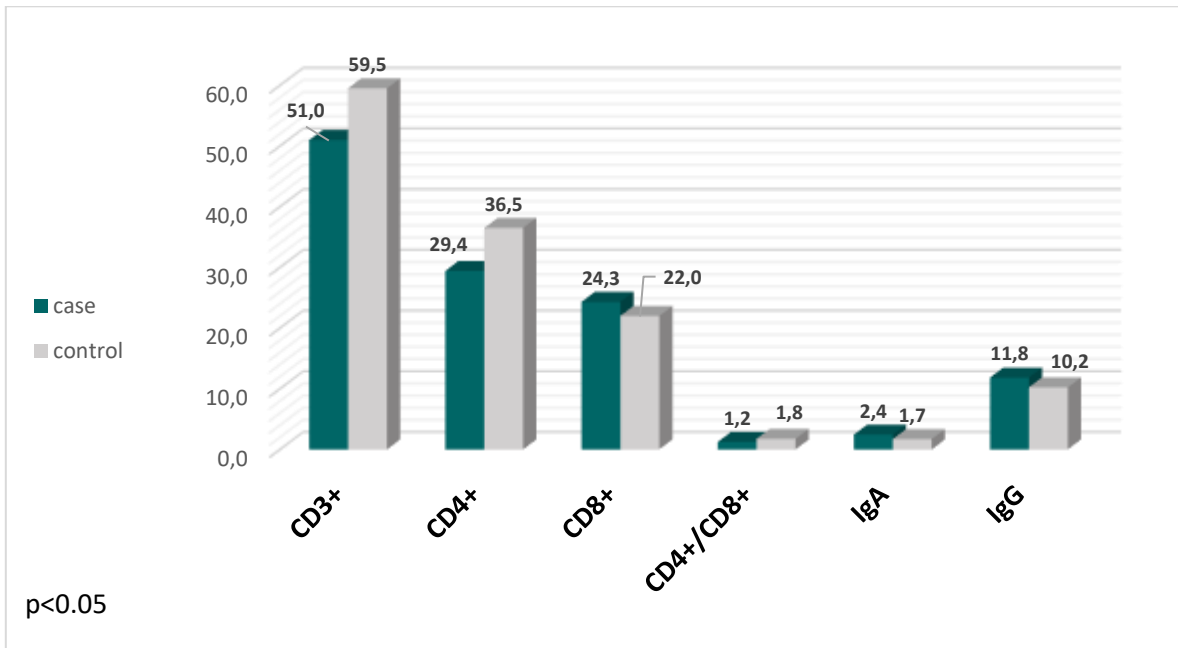
Fig.3 Level of lymphocytes in the study group and control group (**p< 0.05)**

Also, the study group was divided into 2 subgroups according to the subtype of rosacea (ETP, PPP) and then the subgroups were compared based on IMGG plus indicators. As a result of the comparison, statistically significant differences were identified, as well as trends in the following indicators: NEUT - RI, Re - LYMPH %, CD 4+/ CD 8+, IG %, BASO %, PLT, which had statistically significant differences. (Fig.4)
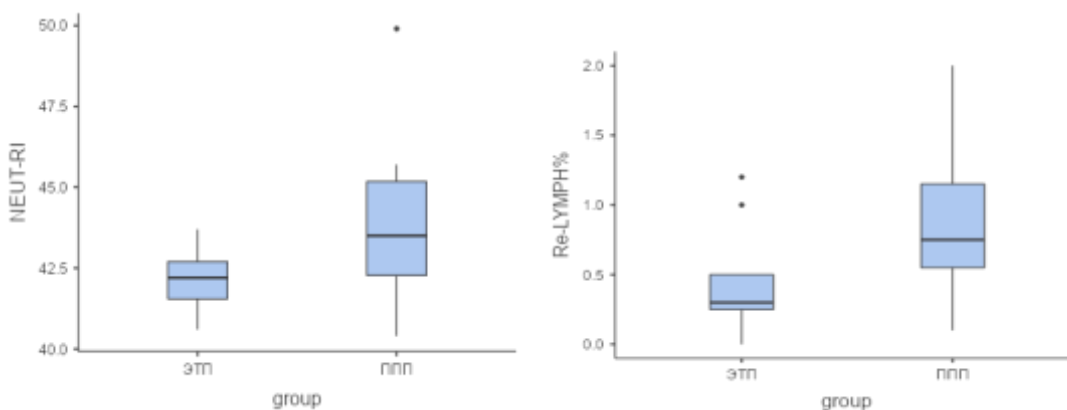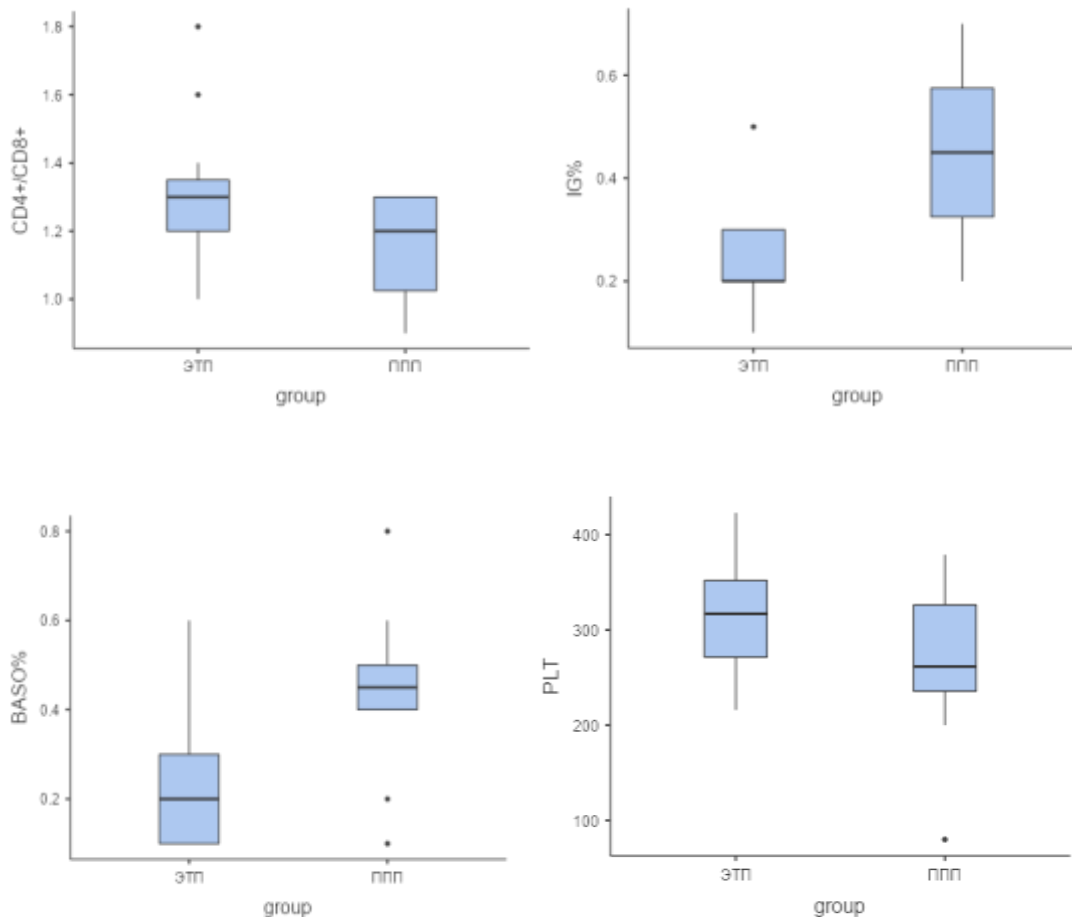
Fig. 4 Intragroup comparisons of the ETP group with PPP. (p< 0.05)

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