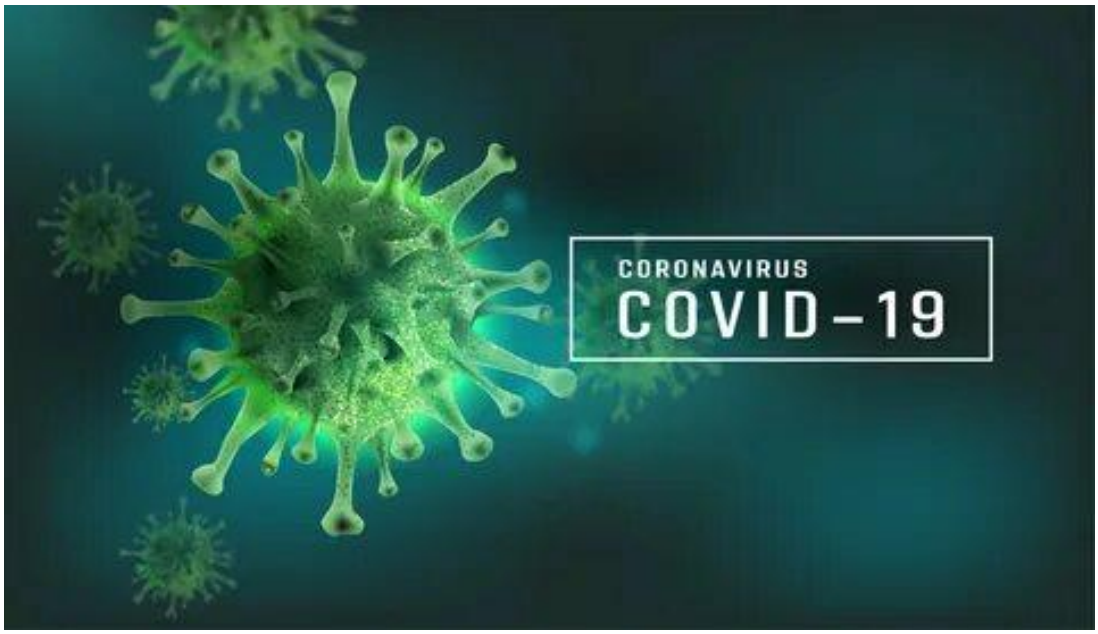
Klebleeva Guzal Davlyatovna

Dermatological manifestations after a coronavirus infection

(Monograph)



Samarkand - 2025

Dermatological manifestations after a coronavirus infections : monograph / comp. Klebleeva G.D. - Samarkand, 2025.

Reviewers:

1. Yarmukhamedova N. A. - Head of the Department Infectious diseases Samarkand State Medical University, Associate Professor

2. Mannanov A.M. - Head of Skin and Venereal Diseases, Children's Skin and Venereal Diseases and AIDS TashPMI, Doctor of Medical Sciences, Professor.

This monograph consists of 4 main chapters, which include dermatological changes after a coronavirus infection. Early diagnosis of risk factors, clinical-functional, biochemical, immunogenetic aspects, reducing the development of its severe course and unpleasant consequences. These issues related to the listed problem require a detailed study, which justifies the relevance of the monograph.
The monograph is intended for doctors - dermatovenerologists, infectious disease specialists, allergists, as well as clinical residents, magistracy residents and doctoral studies in these specialties.

CONTENTS

List of abbreviations

Ig	- Immunoglobulin
Il	- Interlayykin
Me	- Microeveron
Mcg	- microgram
UAC	- General blood test
OAM	- General urine analysis
TNF-α	- Factor of tumor necrosis
Nice	- National Institute of Health and Advanced Experience
TMPRSS2	- transmembrane serin protease 2
RNA	- ribonucleic acid
Central nervous system	- Central nervous system
PRR	- Receptors of images recognition
Dk	- dendritic cells
IFN	- Interferons
ORDS	- acute respiratory distress syndrome
Ars	- antigen -presenting cells
RDC	- dendritic cells in the lungs
DLN	- lymph nodes
TCR	- T-cell receptors
CTL	- cytotoxic lymphocytes
NK	- Natural killers

Introduction

Relevance. In the world, the Covid-19 pandemic has led to a serious crisis of the healthcare system, prevent its consequences, and becomes an urgent problem. According to the World Health Organization (WHO), "... in December 2019, a coronavirus infection diagnosed with the population of the People's Republic, the province of Hubei, Juna and rapidly spreading around the world, still remains one of the urgent health problems. As of July 31, 2021, 198165746 cases of infection with coronavirus were registered around the world, of which 4227760 people died ... "[1]. "... In the Republic of Uzbekistan, 129327 Covid-19 cases were registered during the pandemic period, of which 874 people died. .. "[2]. The increase in the incidence of coronavirus infection, the course of this disease with various clinical manifestations, especially the insufficient knowledge of pathogenetic mechanisms of dermatological changes after coronaviral infection, requires scientific research on the state of microelene status, as well as immune status in patients with dermatological changes after coronaviral infection.

A number of scientific research are conducted in the world aimed at improving the priority areas of dermatovenerology, especially early diagnosis, treatment and prevention of dermatological changes after coronaviral infection. Of particular importance in this connection is the development and implementation of modern methods of diagnosis and treatment of dermatological changes after coronaviral infection.

In our country, large -scale reforms are carried out on the development of the medical sphere, adaptation of medical services to the requirements of world standards, improving the methods of early detection, treatment and prevention of diseases. To switch to medical services for the population to a new level. The priority tasks are defined . In this regard, it is advisable to reduce the incidence of

[1] World Health Organization (acting as the host organization for the Partnership for Maternal, Newborn & Child Health) 2021 (66)/ BO3.
[2] BBC News UZBEK.COM

dermatological diseases, to develop modern methods of diagnosis and treatment of dermatological changes after coronaviral infection.

The covid-19 dermatological manifestations are described in a limited number of publications and are mainly presented by a description of a number of cases. The first message about the manifestations of skin changes associated with Covid-19 was represented by Italian scientists, the results of this study recorded that 18 (20.4%) of 88 patients with Covid developed skin lesions (Recalcati et al., 2020). The study of Italian authors showed that 88 patients with Covid-19 showed that 20.4% of patients had skin manifestations in the form of erythematous rashes, urticaria and vesicals similar to chickenpox, mainly in the body with slight itching or without or without itching him. In addition, the authors reported that these skin lesions did not correlate with the severity of the disease. At the same time, it was reported that in patients with Covid-19, urticaria may manifest themselves without any respiratory symptoms (cough or fever) (Henry et al., 2020).

In recent years, attention has been paid to the pathogenesis of dermatological changes after a coronavirus infection. And the stylish cause of dermatological changes, uncertainty in relation to whether they appear due to direct effect infection or are associated with systemic diseases (for example, reactive or caused drugs), and the best of all To manage them is an urgent problem that makes it difficult to understand these dermatological manifestations (N.A. Belyakov, 2020).

In our country, a number of scientific research in the field of epidemiology, diagnosis and treatment of pathology of internal organs during infection covid-19 , including the study of the problem of influence covid-19 on therapeutic, ophthalmic pathologies or diseases in coronaviral infection (Muminov D.K., 2021; Fataeva D.R., 2022; However, the microelene and immunological characteristics of the clinical course of dermatological manifestations after the coronaviral infection were not studied.

It is worth noting that, despite the fact that today there are many studies devoted to this pathology, many issues related to the microelene and immunogenetic

features of the course of dermatological changes after coronaviral infection remain unbearable to the end.

Chapter I. A modern view of coronavirus infection (Covid-19) and its dermatological manifestations (Review of literature)

§1.1. Epidemiology and pathogenesis of coronavirus infection

The World Health Organization has developed a global platform to register patients infected with Covid-19, which is necessary for planning and conducting anti-epidemic, information and medical and diagnostic measures in various countries of the world [128, p. 1240; 135, p. 43; 136, p. 80].

The International Taxonomy Committee for this pathogen is given the name-SARS-COV-2A, while the World Health Organization has been applied to the name Covid-19 [118, p. 3; 119, p. 6]. The pandemic of the Covid-19 led to a serious crisis of the healthcare system around the world and led to unprecedented efforts to contain the pandemic and its consequences. At the time of July 31, 2021, 198165746 cases of coronavirus infection were registered around the world, of which 42,27760 people died [118, p. 4]. In the Republic of Uzbekistan, for the period of pandemia, 129327 COVID-19 cases were registered, of which 874 people died [6, p. 93; 118, p. 3].

It is currently known that SARS-COV-2 belongs to RNA-containing viruses, coronavirus family, BETA-COV line, the source of infection of which is a person, and the transmission paths of infection include airborne, contact, airborne and fecal-oral-oral ways [8, p. 66; 27, p.1407; 77, p. 36; 79, p. 56; 122, p. 240; 127, p.16].

The Covid-19 pathogenesis is not defined, but numerous studies show that the virus has the same mechanism with which it penetrates into the host cells or penetrates them, as well as Sars-Cov -2 [1, p.15; 15, p.10; 33 , p. 28 ; 46, p. 116; 54, p. 503].

C announced by the data of the National Institute of Health and Advanced Experience (nice), post -shaped states are classified for the following time characteristics: acute coronavirus infection in which the symptoms of viral infection lasts up to four weeks, the continuing symptomatic coronaviral infection from 4 up to 12 weeks, as well as a post -shoe syndrome that lasts more than 12 weeks.

The origin of the SARS-COV-2 is not exactly established, however, it was established that bats are a source of bound viruses and that transmission from a person plays a decisive role in his pathogenesis. After penetration into the target cell after the SPIKE protein association with its receptor, the viral RNA is encapsulated, polyadenilized and encodes various structural and non-structural polypeptide genes. These polyproteins are broken down by proteases that show chimotrip-like activity [59, p. 67; 64, p. 203; 78, p. 24; 80, p. 25]. Although the transmembrane serin protease 2 (TMPRSS2) is the main protease associated with the activation of COV, and was associated with activation of SARS-COV-2, recent data analysis analysis of unicellular RNA (SCRNA-EQ) show that ACE2 and TMPRSS2 are not expressed [99, p. 43; 116, p. 88; 123, p. 80; 130, p.138]. In the same cage, which involves the participation of other proteases in this process, such as Catensin B and L [138, p.18; 141, p.146].

In the process of infection with this virus, there is damage to cells with angiotensin -converging enzyme II with receptors, which are located on the surface of cells of the respiratory system, esophagus, kidneys, heart, central nervous system and other organs [18, p. 49]. It is interesting to note that earlier Hamming et al. In their work, the presence of ACE2 was demonstrated in the basal layer of epidermis and hair follicles, as well as smooth muscle cells surrounding the sebaceous and exocrine glands [66; With. 631-637]. At the same time, Goren et al. They put forward the hypothesis that androgen receptors can also be of great importance in dermatological manifestations after the Covid-19 infections [58, p. 150].

§1.2. Immunological changes after a coronaviral infection (Covid-19)

Despite the many studies in the field of studying changes in the COVID-19 immunity, this problem still remains insufficiently studied. It should be noted that according to a number of authors, the immunity after the coronavirus infection remains not persistent, which causes re -infection with the virus [3, p. 705; 23, p. 24; 38, p. 192; 62, p. 57; 85, p. 35; 90, p. 47].

As a rule, the receptors of images recognition (PRR) recognize invading pathogens, including viruses. Viruses cause several key immune answers of the owner, such as an increase in the release of inflammatory factors, induction and ripening of dendritic cells (DC) and an increase in the synthesis of interferons of type I (IFN), which are important to limit the spread of the virus [92, p. 65; 102, p. 232; 124, p. 113; 140, p. 44]. SARS-COV-2 activates both congenital and acquired immune response. CD4 + T cells stimulate B cells to the production of virus-specific antibodies, including immunoglobulins (IG) G and IgM, and CD8 + T cells directly kill the cells infected with virus. T-highpers produce pro-inflammatory cytokines and mediators that help other immune cells. SARS-COV-2 can block immune protection of the owner, suppressing the functions of T cells, causing their programmed death of cells, for example, by apoptosis. In addition, the production of complement factors, such as C3A and C5A and antibodies, is crucial in the fight against viral infection [3; 700-708 -b].

Thus, the pathogenesis of dermatological manifestations after the Covid-19 is largely the result of an abnormal reaction of the host or excessive reaction of the immune system in some patients. This leads to the local formation of extremely high levels of a large number of inflammatory cytokines, cheemokins and free radicals that cause serious damage to the lungs and other organs. In the worst case, the system response leads to polyorgan failure and even death [24, p.158; 35, p. 4; 100, p. 90]. Syndrome of acute respiratory distress syndrome (ARDS) is the main cause of death at Covid-19. However, the exact reason that this is an ordinary immunopathological event for SARS-COV-2, SARS-COV and Mers-COV infections is unclear, although this is probably due to the generation of a cytokine storm [35, p. 4]. In general, the following transcriptions of dermatological manifestations after the Covid-19 SARS-COV-2 infections differs from other high-toe coronaviruses and common respiratory viruses, such as IAV, HPIV3 and RSV. It is noteworthy that, despite the decrease in the response of the IFN-I and-III to SARS-COV-2, recent studies show a stable Hemokin signature [63, p. 66].

In patients with dermatological manifestations after the coronaviral infection (Covid-19), the number of leukocytes can vary depending on leukopenia, leukocytosis and lymphopenia, although lymphopenia, apparently, is more common. It is important to note that the number of lymphocytes is associated with an increase in dermatological manifestations after Covid-19 infections. Lymphopenia and a decrease in the number of lymphocytes indicated a poor prognosis in patients with COVID-19 [7, p. 32]. The etiology and mechanisms of lymphopenia in patients with dermatological manifestations after Covid-19 are unknown, but SARS-like viral particles and RNA SARS-COV were found in T cells, which indicates the direct effect of the SARS virus on T cells, potentially through apoptosis [3 , p. 705; 6, p. 94; 26, p. 19; 89, p. 366; 90, p. 47].

The role of dendritic cells in protecting the host body with dermatological manifestations after Covid-19 is unclear. During the infection of SARS-COV, the function of antigen-presenting cells (APC) changes, and impaired migration of dendritic cells leads to a decrease in the slice of T cells [23, p. 25; 75, p. 70]. This, in turn, leads to a decrease in the number of virus-specific T cells in the lungs. After the initial infection with the virus, the resident respiratory dendritic cells in the lungs (RDC) are looking for invasive pathogen or antigens in infected epithelial cells, and during activation they treat antigen and migrate in drainage (medium -walled and cervical) lymph nodes (DLN). Once in DLN, RDC represent a processed antigen in the form of a MHC / peptide complex with a naive circulating T-cells. The interaction of the T-cells receptor (TCR) with the Peptide-MHC complex and additional kostimulating signals cause the activation of T cells, intense proliferation and migration to the infection [3, p. 705; 23, p. 25].

Cytotoxic lymphocytes (CTL) and natural cells (NK) are important for monitoring viral infection, and the functional depletion of cytotoxic lymphocytes can increase the severity of diseases. In patients with dermatological manifestations after Covid-19, the total amount of NK and CTL decreases, which occurs in parallel with the depletion of their function and increased regulation of the NK CD94 / NK

inhibitor 2, member A (NKG2A) [83, p.184]. After the successful recovery of patients from Covid-19, the number of NK and CD8 + T cells was restored with reduced NKG2A expression. In addition, patients with COVID-19 have a lower percentage of CD107A + NK, IFN-γ + NK, IL-2 + NK and TNF -α + NK cells [83, p.184].

As indicated above, increased Apoptosis of T cells occurs in patients infected with Mers, and it is likely that this also occurs in patients with dermatological manifestations after Covid-19. In addition, there was a violation of the activation of CD4 and CD8 cells, as evidenced by the appearance of the CD25, CD28 and CD69 expression on these subpopulations of T cells. These factors together can explain the delay in the development of an adaptive immune response and the prolonged clearance of the virus after the SARS-COV infection in humans [8, p. 67; 77, p. 37; 114, p.100; 121, p. 368; 133, p.108].

In order to develop neutralizing antibodies, it is important that the viral antigen is recognized by the APC, since they subsequently stimulate the humoral immunity of the body through virusspecific B and plasma cells [87, p.1216]. With SARS, important antibodies are IGM and IgG, which were found in the patient's blood 3-6 days after infection, and IgG - after 8 days [87, p.1215]. IGM antibodies, specific for SARS, disappeared by the end of 12 weeks, while IgG antibodies can be persisted for a long time. This suggests that the formation of IGG antibodies can be important for ensuring a long -term protective role [87, p.1216]. Interestingly, 40-60% of people who were not exposed to SARS-COV-2 also had the answers of CD4 + cells against SARS-COV-2, which indicates the degree of cross-reactivity between COV-2 [87, p.1215].

In addition to cellular and humoral protection from the immune system, the release of anti-inflammatory cytokines also helps against Covid-19 infection. Effector cytokines, such as IFN-γ, directly inhibit the replication of the virus and enhance the presentation of the antigen [81, p. 270]. However, it was suggested that the SARS-COV-2 due to the secretion of a new short protein encoded by ORF3B inhibits the IFN-β expression and enhances viral pathogenicity [81, p. 271].

Among the mediators of inflammation released by immune effector cells are the cytokines IFN-α, IFN-γ, IL-1β, IL-6, IL-12, IL-18, IL-33, TNF-α and the transforming growth factor (TGF) β and Khemokins, such as CCL2, CCL3, CCL5, CXCL8, CXCL9 and CXCL10 [35, p. 4]. Early clinical manifestations (fever, confusion of consciousness) and laboratory showed (hyperferitinemia of blood, lymphopenia, prolonged prothrombin time, increased lactate dehydrogenase), increased IL-6 level, an increased level of soluble CD25 in patients with dermatological manifestations after COVID- 19 suggest the presence of CSS, which causes the ARDS and multiple organ failure [35, p. 4].

The reason for the stability of children to Covid-19 is also unclear. In addition, in other messages, a hypothesis was expressed that the lower risk of infection among children is due to differential expression of angiotensin-spinning enzyme 2 (ACE2), which increases with age the expression of its gene in nasal epithelia [18, p. 50; 66, p. 634; 71, p. 75].

It should be noted that the risks of mortality after the Covid-19 were not associated with chronological age or age-related changes. However, so far there is a limited amount of data that allows you to distinguish any specific genetic markers. In addition, all over the world attempts to determine the genetics of human protective immunity against SARS-COV-2 infection. The goal is to compare the extreme values of susceptibility to SARS-COV-2 in young people with dermatological manifestations after Covid-19 and subjects without dermatological manifestations, despite the high level of viral exposure [107, p. 63].

Early analysis of blood samples using SCRNA-EQ revealed some interesting features [39, p. 55; 41, p. 28; 72, p. 62]. These include a diverse IFN-stimulated response and suppression of class II HLA. It is important to note that circulating leukocytes do not express high levels of pro -inflammatory cytokines and chemokins [15, p. 10; 35, p. 4].

In conclusion, it should be noted that the owner's immune response is a decisive factor in the development of dermatological manifestations after the coronavirus infection (Covid-19). And the analysis of this response can give a

clearer picture of how the owner's response affects the duration of dermatological manifestations in people who have undergone coronavirus infection [3, p. 705; 25, p. 7].

§1.3. Dermatological manifestations and coronavirus infection

As a rule, the skin is considered a part of the immune system, since it acts as a shield against various environmental irritants, while a violation of the integrity of this barrier due to ruptures, scratches, needles, previously existing infections or skin diseases, wounds and burns can contribute to the penetration of microorganisms [2, p. 425; 12, p. 280; 17, p. 58; 31, p. 80; 97, p. 508].

Therefore, patients without dermatological manifestations after Covid-19 are subject to more frequent occurrence of dermatological manifestations, which may be associated with immunosuppressive therapy used in treatment [48, p. 35; 67, p. 87; 108, p. 123; 129, p. 237; 139 , p.112].

Being a relatively new pathology, the coronavirus infection due to the polyorganic nature of the defeat of the body has many clinical manifestations, including dermatological, the study of which still remain the subject of research. Since its distribution in society, there have been very few reports about dermatological manifestations after Covid-19 in newborns and adults [2, p. 425; 17, p. 58; 31, p. 80].

At the beginning of the pandemic, dermatological changes were rarely documented, possibly due to the lack of conditions for a complete skin examination, subsequent studies showed a significantly larger number of cases of skin lesions and the occurrence of dermatological manifestations. The true cause of dermatological changes after the coronaviral infection, uncertainty in relation to whether they appear in connection with the direct effect of infection or are associated with systemic diseases (for example, reactive or caused drugs), and how best to control them are urgent problems that make it difficult to complicate Understanding these dermatological conditions [19, p. 112; 31, p. 80; 48, p. 35].

It should be noted that dermatological manifestations After the coronavirus infection (Covid-19) are described in a limited number of publications and are presented mainly by a description of the series of cases. The first message about dermatological manifestations after a coronavirus infection (Covid-19) was compiled by Recalcati et al. Which said that 16 of 92 after Covid-19 V (18.6%) developed dermatological lesions [108, p. 123]. Most of these damage were found on the body, arms and legs. The generalized macular or maculopapapulus exanthema was the most frequent dermatological manifestation, it was followed by vesicles similar to chickenpox, and cold urticaria [108, p. 123]. These inflammatory lesions most often occurred in the early stages after recovery from the disease, and sometimes were primary, and sometimes preceding systemic infectious manifestations. Damage to the endothelium can be a key mechanism in the pathogenesis of "frostbite" after the coronaviral infection (Covid-19), as well as, possibly, in the development of microangiopathies. It was also reported about vascular lesions, including frostbite, reticular Liedo, necrotic purple. In particular, the skin lesions described by Pistorius et al were of considerable interest. In Journal de Médecine Vasculaire [101, p. 222]. Unlike inflammatory lesions, vascular lesions occurred later in the course of the disease, usually a few days after the appearance of general symptoms. Since the PCR on strokes from the nasopharynx was not carried out in the early stages after the Covid-19, dermatological manifestations were probably underestimated. Therefore, for all patients who had dermatological lesions after the SARS-COV-2 outbreak, great interest is the conduct of serological tests to assess the relationship between these lesions and the SARS-COV-2 infection [2, p. 426]. In all registered cases, 100% of patients reported a complete healing of dermatological lesions after healing up to 10 days [2, p. 425; 12, p. 280; 31, p. 82]. There were no defeats about relapse. In some cases, the use of local steroids could contribute to a faster resolution of lesions. Since the SARS-COV-2 infection led to asymptomatic cases within 14 days after

infection, dermatological manifestations could serve as a late indicator of infection, helping to make a timely diagnosis [44, p. 37; 48, p. 35; 67, p. 87].

A recent Italian study of 88 patients with dermatological manifestations after coronavirus infection (Covid-19) showed that 20.4% of patients had dermatological manifestations in the form of erythematous rashes, urticaria and vesicals similar to chickenpox, mainly on the body with insignificant itching or without it him. In addition, the authors said that these skin lesions did not correlate with the immunological conditions of the body. Similarly, Henry et al. It was reported that in patients with dermatological manifestations after coronavirus infection (Covid-19), urticaria may occur without any respiratory symptoms (cough or fever) [70, p.180]. On the same side, a patient with dermatological manifestations after coronavirus infection (Covid-19) in Thailand erroneously diagnosed Denge fever, since the main manifestations were a dermatological rash with peteches and a low number of thrombocytes [69, p. 56]. In general, Galván Casas et al. We conducted the first prospective study to classify dermatological manifestations after illness. Dermatological manifestations were divided into five main clinical patterns, including pseudo - renovation (19%), vesicular rashes (9%), urticaria (19%), maculopapules (47%) and lvedo or necrosis (6%) [55, p. 77]. Under these conditions, dermatologists should pay special attention to patients with a dermatological rash after a coronaviral infection (Covid-19) [55, p. 78].

In addition, there were reports of a wide spectrum of dermatological manifestations associated with an infection caused by severe acute respiratory syndrome due to coronavirus 2 (SARS-COV-2) and covering almost all inflammatory processes [2, p. 425]. The variety of observed dermatological manifestations differed significantly in comparison with other viral infections, which are usually manifested by characteristic dermatological patterns. It should also be noted the seemingly high (according to one study of 20%) prevalence among adults who rarely treat viral exanthemans. Understanding the true prevalence of

dermatological changes is complicated by the lack of testing, as well as a probable bias in existing publications [12, p. 280; 17, p. 58; 48, p. 35; 69, p. 56].

The largest series of dermatological manifestations today, which included 375 patients, identified 5 predominant morphological patterns such as spotted papular rashes, urticaria, pseudo-reinforcements, vesicular rashes and LIVIDEVID [55, p. 78]. The ability to characterize and classify dermatological changes by morphological patterns will help substantiate hypotheses and subsequent studies of the involved mechanisms. For example, lideid changes are associated with occlusion of dermatological vessels, and in patients in patients after the Covid-19 infections and levere changes indicated the likely complement-mediated vasculopathy, which could portend systemic thrombosis [55, p. 78].

In addition, Aral dermatological changes similar to frostbite (also known as the fingers after the Covid-19) caused confusion and disputes among dermatologists. The detection of such changes similar to frostbite in several patients with infection, which is documented after Covid-19, as well as early messages of the ultrastructural detection of the SARS-COV-2 and a strong type of type I-type signal in these dermatological lesions, suggest a pathophysiological relationship that goes out beyond the scope of the Provisional Association [2, p. 426]. Nevertheless, in other studies of a series of cases with these dermatological manifestations, infections were not found after transferred by SARS-COV-2 either with a smear from a nasopharynx or using serological tests. It remains unknown whether this is a manifestation of the late phase of the immune response after the coronavirus infection (Covid-19) or it is associated with the inability to cause humoral immunity [84, p. 243].

At the same time, it is extremely important not to lose sight of other dermatological changes in patients with dermatological manifestations. It must also be remembered that skin lesions can be associated with side effects of drugs or other complications of infection (dissensized intravascular coagulation) [15, p. 11].

It should be noted that the mechanisms of dermatological manifestations associated after the coronavirus infection (Covid-19) have not yet been fully

studied. In addition, it still remains unclear whether dermatological manifestations are secondary changes in the powerful immunological reaction or the primary infection of the skin itself. Also, the difference in time of the beginning of inflammatory and vascular lesions may indicate that these dermatological lesions are of different origin [21, p. 40; 44, p. 37]. In this connection, conducting in -depth studies in the field of dermatological manifestations after a coronavirus infection is an extremely urgent problem [44 , p. 37].

§1.4. Aspects of the treatment of dermatological manifestations after a coronavirus infection

Until now, the specific treatment of dermatological manifestations after the adopted coronavirus infection SARS-COV-2 has not been created. Based on the pathological features and clinical phases of the COVID-19, the following classes of drugs began to use the coronavirus infection in patients: antiviral drugs, inflammation inhibitors-anti-springs, low-molecular weight heparins, plasma and hyperimmune immunoglobulins [12, s. . 278; 14, p. 50; 73, p. 67; 98, p. 174; 139, p. 112; 144, p. 36] . In the early stages after the SARS-COV-2 infections, antiviral agents can prevent the progression of the disease, while immunomodulating and antiviral agents improve clinical outcomes in patients [12, p. 280; 14, p. 50; 73, p. 67; 98, p. 174; 113, p. 953; 138, p.18; 144, p. 7].

With the beginning of the pandemic after the coronavirus infection (COVID-19), studies aimed at identifying drugs, as well as therapeutic approaches to treatment, began to be carried out throughout the world. Due to the complex pathophysiological mechanisms of the occurrence of dermatological manifestations after adopted coronavirus infection, as well as pulmonary and impaired manifestations and immunominated effects, treatment after transferred coronaviral infection, is a rather complex task compared to other viral diseases [12, p. 279; 14, p. 49; 73, p. 67; 98, p. 174; 113, p. 953; 139, p. 110; 144, p. 36].

Non-drug interventions, including hyperbaric oxygenotherapy, extorporepical membrane oxygenation (ECMO), aggressive dialysis and other interventions, all with varying degrees of clinical success, are used after COVID-19 [12, p. 280; 14, p. 50; 73, p. 67; 98, p. 174; 139, p. 112; 144, p. 36].

Covid-19 raised many important questions about the current conduct of patients with dermatological diseases. In the early days of the pandemic, many expert recommendations were developed on how best to conduct patients receiving systemic immunosuppressive therapy shown in dermatological manifestations, including corticosteroids and biological agents [19, p. 112; 28, p. 2; 43, p.1034; 58, p.152; 86, p. 1218; 103, p. 72; 139, p. 111].

All over the world, many registers have been created for collecting clinical outcomes in patients with certain dermatological manifestations after a coronaviral infection. An important issue is whether patients have increased susceptibility to SARS-COV-2 infection compared to patients who did not have dermatological manifestations. Development of joint research and systems for rapid research in various healthcare systems in order to study dermatological manifestations of infection after Covid-19, another urgent problem of modern dermatovenerology [54, p.503; 74, p. 49; 101, p. 221; 111, p. 56; 139, p. 112].

The question of whether all patients with dermatological manifestations need after a coronavirus infection (Covid-19) in qualified dermatological care was discussed, especially in cases of probable non-specific dermatological reactions, such as pathological rashes or urticaria observed after the SARS-COV-2 infections [19, p. 112; 29, p. 79; 45, p. 27; 58, p.145; 74, p. 50; 86, p. 1218].

Conforti et al. It was suggested that immunosuppressants can be associated with a higher risk of opportunistic infections, since they weaken the immune response [45, p. 28]. Thus, Conforti et al., Suggested that the use of biological products should be balanced in the conditions of pandemia, in order to restrict and/or reduce the time of taking of these drugs and terminate all immunosuppressants in patients after the covid-19 infections [45, With. 28].

According to the consensus of experts, from New Zealand and Australia, it is recommended to cancel all immunosuppressants (with the exception of systemic corticosteroids, which should not suddenly cancel or reduce) in patients without dermatological manifestations after an infection suffered, for at least 4 weeks. While for patients with dermatological manifestations, the dose of immunomodulators should be reduced or canceled for up to 2 weeks. On the contrary, Bashyam et al. It was reported that some biological products can even play a protective role and strengthen the aberrant immune response to the Covid-19 [26, p. 19].

§1.5. The role of microelements in the treatment of dermatological manifestations after a coronaviral infection (Covid -19)

At present, in the treatment of dermatological changes and pathology after coronavirus infection, there is no single approach, since in each case of the disease of its tactics it is determined individually, taking into account a number of factors [19, p. 112; 29, p. 79; 43, p.1034; 58, p.146; 74, p. 50; 94, p. 669; 139, p. 112].

It is known that the skin of a person is a place where many conditionally pathogenic microorganisms grow (3.2-98%, 7.5 -11.1.1 of CFUs). Reducing the skin turgor, constant injuries of the skin due to itching and combing, violation of sebaceous and sweat secretion, shifting the skin of the skin towards alkalosis, impaired microcirculation create favorable conditions for the colonization/reproduction of pathogenic microflora and the further development of dermatological rashes after coronavirus infection (COVID-19).

The peresistence of viruses in the tissues is lifelong and, unfortunately, there are still no means that contribute to the complete elimination of the body of viral particles. Since evolutionary viruses served transfer the "blocks" of genetic information, i.e. In bacteria, up to 30% of the genome can consist of incorporated viruses that carry specific information about the genes of enzymes that inactivating antibiotics.

One of the important components of treatment for dermatological manifestations is the use of vitamins and trace elements, as well as a diet correction. The identified trace elements were ranked according to the following classification:

1. **For life necessity:**

- Essential ME: **Fe, I, Cu, Zn, Co, Cr, Mo, Se, Mn;**
- Conditional: **as, b , br , f , li , ni , V , si ;**
- toxic: **al, CD, PB, HG, B E, Ba, VI, TL;**
- Potentially toxic: **gt, au, in, rb, ag, ti, te, u, w, sn, zr** and others.

2. **According to the immunomodulating effect;**

- Essential for the immune system: **zn , i , li , cu , co , cr , mo , se , mn , fe ;**
- Immunotoxic: **al, as, b, ni, CD, PB, HG, BE, VI, TL, GE, Au, Sn, Cl** and other.

Despite their ultranial content in the body, microelements play important roles in many biochemical processes, such as the effect on specific receptors, the effect on the activity of enzymes and hormones, proteins-carriers, etc., which is reflected in the functional state of immune, endocrine and many vital systems [10, p. 43; 11, p.124; 30, p. 350; 76, p. 678; 95, p. 851; 104, p. 680].

Microelements, including vitamins and minerals, are not included in important components of the skin structure, but they can also modulate several biological functions. Although the importance of these trace elements is widely recognized, therapeutic drugs using such nutrients substances are limited to antioxidants and stimulation of wound healing [10, p. 42; 11, p.124; 32, p. 349; 76, p. 690; 104, p. 681] . Like finds that need to show the new role of vitamin D in the stimulation of the main epidermal antimicrobial peptide, Katelicidine, thereby stimulating the innate n immunity (gombart et al., 2005) necessary in further studies in order to better understand the previously uncertainty The role of nutritious trace elements in order to develop potential therapeutic agents for the treatment of dermatological manifestations after a coronaviral infection.

Tamsen-Jones K. et al. Back in 1987, 15 of the most important trace elements were allocated, 5 of which are non -metals, such as iodine, selenium, fluorine, silicon and possibly arsenic, while the remaining ones belong to metals - copper, iron, manganese, zinc, cobalt, nickel, chrome , Vanady, molybdenum and tin.

Microelements play an important role in the immune system and, therefore, can have a positive effect on the outcome of the treatment of dermatological manifestations after a coronaviral infection (Covid-19) [32 , p. 349; 93, p. 271; 95, p. 851; 104, p. 680]. Antioxidants enhance natural cells and lymphocytic activity, and also increase the products of Interleukin-2 [32 , p. 349; 93, p. 272; 104, p. 681].

Zinc deficiency is when the body lacks mineral zinc. Zinc is important for the immune system, healing of wounds and normal growth and development of hair and nails. Moderate deficit (low zinc level in biological material) resembles acrodermatitis and alopecia, and a pronounced zinc deficiency causes dermatological changes in the form of pigmentation, slowing hair and nail growth, as well as damage to the skin in areas bodies undergoing, in particular, multiple pressure and friction. Only 6% zinc in the body is in the skin. zinc is present both in epidermis and in dermis , although its level in the epidermis is five times higher. In the physiology of the skin, zinc stabilizes cell membranes, serves an important cofactor for several metal -fergers and participates in mitosis and differentiation of basal cells . in The normal human skin is expressed in the basal keratinocytes epidermis and in the cells of hair follicles. Zinc is expressed in hair follicles and at low levels in the basal cells of the epidermis; In addition, zinc is significantly induced in proliferating basal keratinocytes with chemical stimulation or damage. Thus, active keratinocytes indicate the role of zinc in epidermal proliferation [107, p. 63]. Based on these data, the condition of patients who have undergone coronavirus infection (Covid-19) can affect the progression and outcome of the disease. Despite the lack of reports of malnutrition in medical science or in home isolation after a coronavirus infection (Covid-19), such conditions as chewing problems, physical disabilities and cognitive disorders can provoke exhaustion [98, p.174].

In addition, a nutritical status, depending on both macro- and on micronutrients, is vital for the health of the skin. Proper nutrition complements endogenous factors in the regulation of the barrier function of the skin. Vivid examples of nutrients are calcium and vitamin C, which are responsible for the differentiation of keratinocytes, the main type of epidermal cells. Calcium is an element of natural hardness. It is more in the skin than in plasma. He plays the role of a “sewing agent” supports the moisture -holding skin function. Helps the skin restore the necessary level of moisture. With a lack of calcium, the skin becomes thin and fragile, even paper. A decrease in nutritional status can change the structural and biological function of the skin leading to dermatological anomalies, including dry skin.

Minerals, including zinc, copper and selenium, also play an important role in maintaining skin health. Zinc is an important cofactor of many metal farments. Zinc controls the production of skin fat. Thanks to what prevents the formation of inflammation and black dots. Its main function to protect the skin from photography by absorption of ultraviolet radiation. Although a patient with a dermatological pathology also observed a significant decrease in zinc level, zinc additives do not lead to a clinical improvement in this pathology. Like zinc and vitamins C and E, copper with peptides also serves as an antioxidant, protecting the skin from damage, which is caused by an increase in the level of free radicals caused by ultraviolet light. One of the main tasks of zinc maintaining a good condition of the skin, nails and hair. In addition, it is known that copper stimulates the ripening of collagen, therefore it is crucial for improving the elasticity and skin thickness. Finally, selenium protects the skin from oxidative stress caused by UV radiation, stimulating the activity of selenium-dependent antioxidant enzymes, glutathioneperoxidase and thioredoxynredus, which are present in the plasma membrane of epidermal keratinocytes [96, p. 7] . Research results in public showed that an increase in the amount of selenium in the diet leads to an increase in the level of glutathione peroxidase in patients with dermatological manifestations, which leads to an improvement in the condition.

Since selenium deficiency was found in patients with dermatological manifestations, the level of selenium is one of the main markers of this disease.

Zinc is necessary to maintain an adequate state of the immune and redox systems, and also prevents the penetration of the virus into the cells of the respiratory system. In fact, its deficit can be considered one of the risk factors that can predispose to the appearance of dermatological manifestations after the infection undergoed Covid-19 and worsen the forecast [98, p. 174]. Zinc salts, apparently, suppress the replication of some viruses, including SARS-COV. Thus, providing the correct consumption of zinc is possible to improve the reaction of the owner and protection after the posted coronavirus infection [98, p.175; 104, p. 683]. Clinical trials have shown the advantages of taking zinc drug both in monotherapy and in combination with vitamins D or C for patients who have undergone coronavirus infection (Covid-19). The effectiveness of treatment was to reduce dermatological manifestations, hyperemia and itching observed in patients after the coronaviral infection (Covid-19) [104, p. 680] . Selenium-antioxidant, Selenium helps to support elasticity in the tissues, including the skin [96, p. 6].

According to Zhang et al. (2020), the use of selenium in high doses has the properties of the suppression of the life cycle and mutations of virulence after SARS-COV-2, which in turn weakens the oxidative stress caused by the virus, as well as damage to organs [143, p.135]. This positive effect can be used in elderly patients, especially at the risk of dermatological manifestations after the Covid-19, since the selenium deficiency positively correlates an increase in inflammatory processes [143, p.136].

The use of vitamins and microelements was widely used in conservative treatment of dermatological manifestations, however, the use of most microelene preparations is carried out empirically without taking into account the quantitative and qualitative content of trace elements in the body. Manganese- increases the synthesis of proteoglycans, which is necessary to preserve the skin turgor. Copper increases the ability of the skin to self -

execution. Increases the density and strength of the skin. The necessary component system of the formation of collagen and elastin. Despite their effectiveness, most of the recommendations for the use of trace elements in the treatment of dermatological manifestations after coronavirus infection (Covid -19) is often scientifically unreasonable, and the number of work is limited. In addition, studies in the study of ways to correct microelements deficits are also few. It should also be noted that the irrational The use of trace elements can adversely affect the condition of not only the body, but the skin and hair, causing microelentoses, which serves as a prerequisite for the study and development of scientifically based approaches to the use of trace elements with dermatological manifestations after the coronaviral infection (Covid -19) [10, p. 42; 11, p.124] .

Resume.

The International Taxonomy Committee for this pathogen is given the name-SARS-COV-2A, while the World Health Organization has been applied to the name Covid-19 [118, p. 3; 119, p. 6]. The pandemic of the Covid-19 led to a serious crisis of the healthcare system around the world and led to unprecedented efforts to contain the pandemic and its consequences. At the time of July 31, 2021, 198165746 cases of coronavirus infection were registered around the world, of which 42,27760 people died [118, p. 4]. In the Republic of Uzbekistan, for the period of pandemia, 129327 COVID-19 cases were registered, of which 874 people died [6, p. 93; 118, p. 3].

In patients with dermatological manifestations after the coronaviral infection (Covid-19), the number of leukocytes can vary depending on leukopenia, leukocytosis and lymphopenia, although lymphopenia, apparently, is more common. It is important to note that the number of lymphocytes is associated with an increase in dermatological manifestations after Covid-19 infections. Lymphopenia and a decrease in the number of lymphocytes indicated a poor prognosis in patients with COVID-19 [7, p. 32].

It should be noted that the risks of mortality after the Covid-19 were not associated with chronological age or age-related changes. However, so far there is a limited amount of data that allows you to distinguish any specific genetic markers. In addition, all over the world attempts are made to determine the genetics of human protective immunity against SARS-COV-2 infection. The goal is to compare Extreme values of susceptibility to SARS-COV-2 in young people with dermatological manifestations after Covid-19 and subjects without dermatological manifestations, despite the high level of viral exposure [107, p. 63].

It should be noted that dermatological manifestations after a coronavirus infection (Covid-19) are described in a limited number of publications and are presented mainly by a description of the series of cases. The first message about dermatological manifestations after a coronavirus infection (Covid-19) was compiled by Recalcati et al. Which indicated that 18 out of 88 after Covid-19 V (20.4%) dermatological lesions developed [108, p. 123]. Most of these damage were found on the body, arms and legs.

Chapter II. Materials and methods of studying the features of the course of dermatological manifestations after a coronavirus infection

§2.1 . General characteristics of clinical material

To study the features of the course of dermatological manifestations in patients, we studied 108 patients after a coronavi-Russian infection, 61 of which were with dermatological manifestations that turned to the Samarkand regional skin and venererological dispensary from June 2020 to July 2021.

When performing work, we used the classification on the cart.

"... October 6, 2021, the WHO officially published a report on a study on the protocol delphi and gave a definition of a" post -shoe state ". The post-shaped state (PKS) occurs in persons after the confirmed laboratory coronavirus infection (detection of SARS-COV-2), usually 3 months after the start of the COVID-19, with symptoms that last at least 2 months and cannot be explained by an alternative diagnosis " . Dermatological manifestations of PKS: hair loss; rashes of the type of acrodermatitis; papulo-scabs; Urticar rashes; papula-vesicular rashes; Bubble rashes like herpes.

The inclusion criteria were:

- Patients who have suffered covid -19, aged 18 years and older;
- Criteria for compliance or the diagnosis of "post -shoe state";
- informed consent to participate in the study.

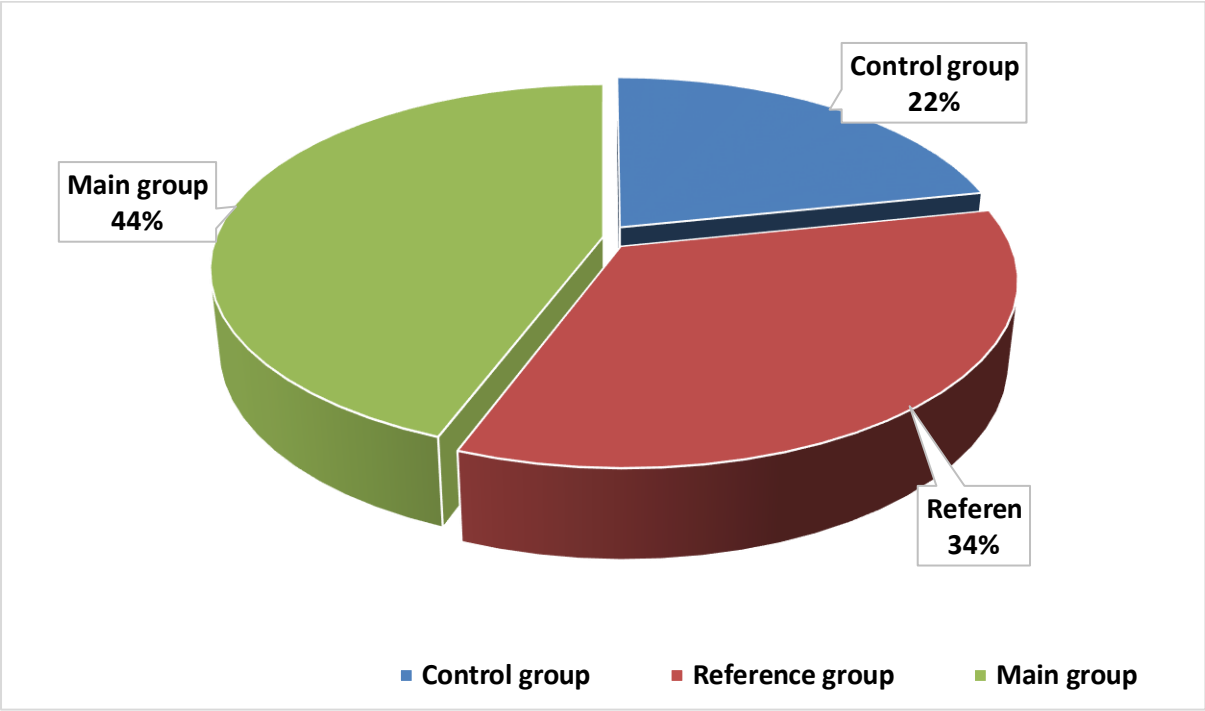
Exception criteria:

- Patients with PKS under the age of 18;
- discrepancy between the criteria of the post -shaped state;
- refusal to participate in the study;
- Refusal to vaccinate.

The main group was 61 (44.0%) patients who had dermatological manifestations, and the comparison group - 47 (34.0%) patients without dermatological manifestations. All of the above patients transferred the coronavirus infection (with ovid -19) and were in a post -shaped state.

The control group was represented by 30 (22%) almost healthy volunteers (Fig. 2.1).

In all patients without dermatological manifestations included in our study, dermatological manifestations after the coronaviral infection were observed after recovery from covid-19.



Rice 2.1. Distribution of examined patients by groups

As the new coronavirus infection was being studied, it became known that the sex of the patients had an important prognostic value. Men were more likely to have dermatological manifestations than women (Fig. 2.2).

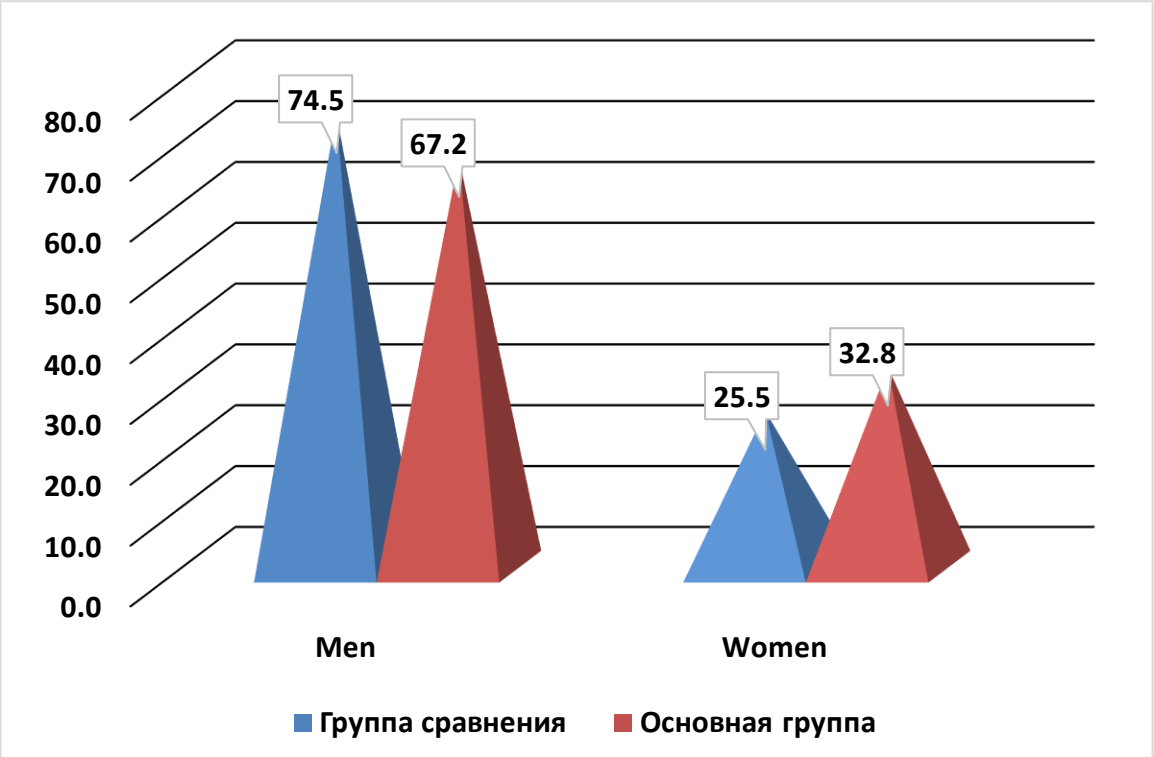
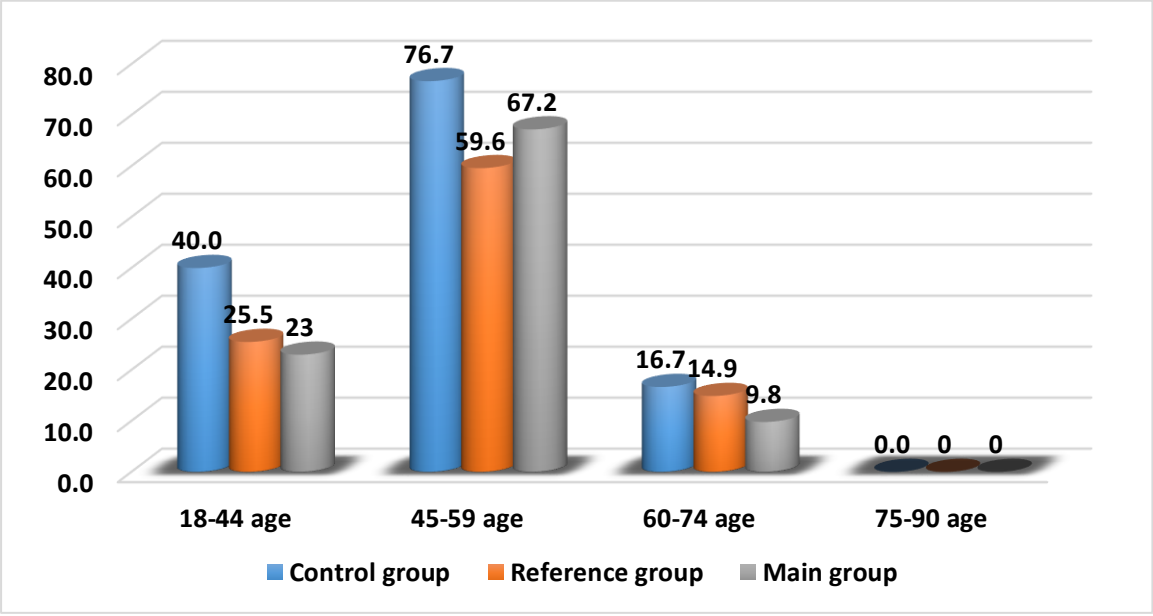


Figure 2.2. Distribution of patients included in the study according to gender

As the new coronavirus infection is studying, it became known that the floor of patients has an important prognostic value. In men, dermatological manifestations were more often observed than in women.

As can be seen from the data given in the table, men over the age of 40 were most often ill.



Rice. 2.3. Distribution of examined patients by age

The average age of all patients was 54.2 ± 12.3 (Fig. 2.3).

§2. 2. Methods Respect I

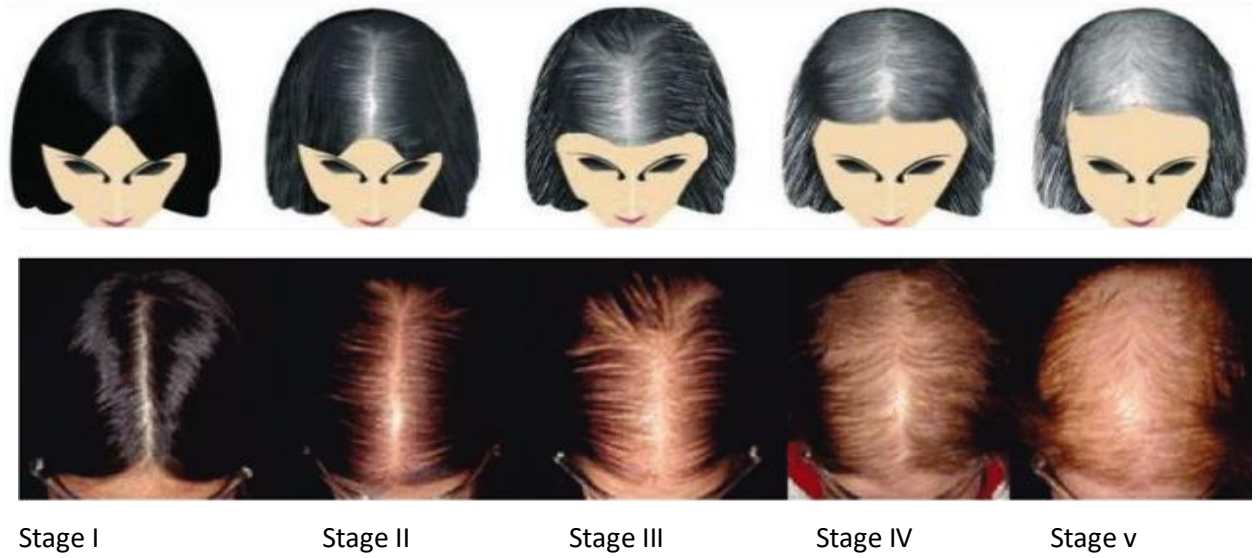
2.2.1. General clinical studies.

According to generally accepted standards, all patients were conducted comprehensive examinations. The examination began with the collection of a detailed and in -depth history of the disease and the life of the patient in order to identify possible etiological factors that led to the occurrence of dermatological manifestations.

General (clinical) blood test; Biochemical test of blood: AST, ALT, Bilirubin, Creatin and Urea, LDG, KFK, Ferritin, General Belok, Albumin; Coagulological studies: prothrombin time (prothrombin ratio and % prothrombin on KVIK). We conducted an objective inspection, which includes: a visual and palpation assessment of the skin. To ensure the initial orientation and to formulate a differential diagnosis, the primary focus was identified. In this case, a search was carried out to determine the primary disease. In addition, we determined the features of the morphological elements of rashes (color, shape, consistency, localization, etc.) in conjunction with the common properties of the skin (general coloring, the state of secretory activity, elasticity, etc.) and the nature of the inflammatory process (purulent, proliferative), which were the most important signs of a particular disease.

All patients conducted a study: a general and biochemical blood test, coagulogram, immunogram and spectrometric hair analysis.

In order to assess the severity of diffuse alopecia, the classification of sinclair (2006) was used, according to which 5 stages of baldness were distinguished. The severity of alopecia was evaluated according to the classification sinclair (2006) in women (Fig. 2.4).



Rice. 2.4. Schematic and photographic image of diffuse alopecia in women according to the classification sinclair 2006

One of the main criteria for diagnosis and differential diagnosis of dermatological diseases was a clinical analysis of morphological elements of rashes.

2.2.2. Immunological research methods

Analysis that defines antibodies on C ovid -19 is PCR Diagnostics. All patients in Covid centers conducted this study to confirm the diagnosis. When applying to the Samarkand regional skin -venereological dispensary, IFA diagnostics C ovid -19 were applied. To clarify the diagnosis to all patients to assess the infection stage, PCR and ELISA were carried out.

Such testing shows high results in accuracy, but there is an important nuance. At first, in response to infection, a person is produced by IGM antibodies, and later after 12 weeks IGG is produced in the post -shaped period.

Therefore, at different times it is advisable to make various If tests. So, IGM is available in the body with severe symptoms of the disease (usually 5-7 days after the first symptoms), and then the concentration of these antibodies falls. In fact, the IGM test can be an alternative to PCR during the active stage of coronavirus infection.

The IgG test shows the presence of immunity to Covid -19. It is advisable to make it already 4-6 weeks after the first symptoms, or even later (7-12 weeks). The reason for passing the analysis on IgG is often the desire of a person to understand whether he suffered a coronavirus infection or not whether his body has developed persistent immunity to infection. In the diagnosis after the coronavirus infection (Covid-19), it allows you to determine the quantitative level of the IGM or IgG antibodies to the SARS-COV-2 of the coronavirus in the clinical sample (serum, heparinized or citrate plasma) on automated analyzers. We used this research method in our work. The principle of reaction: two-stage sandwich method. The reaction system includes a substrate, oxidizing agent, enzyme-catalyst. As a label, the enzyme-catalyst (peroxidase, microperoxidase (fragment of cytochrome C) is usually used as a label, the sensitivity of the method in this case is estimated at 10–13 m antigen, or the substrate molecules (isoluminol, acridine ethers), the sensitivity of the method in this case is estimated at 10- 12 m or up to 0.2 pg of antigen for isoluminol, up to 10–18 m antigen for acridine broadcasts.

The first stage: in the reaction cell, certain amounts of the sample, a solution for processing a sample, paramagnetic microparticles covered with SARS-COV-2 are dosed in the antigen in a buffer with preservatives, then incubation, as a result of the antibodies to SARS-COV-2 present in the sample, are associated with SARS-COV-2 antigens immobilized on the surface of microparticles. Microparticles are captured by a magnet, while unrelated substances are removed by washing. After washing in the reaction cell, a solution of the diluent is dosed, the conjugate of the alkaline phosphatase with monoclonal mouse anti -human antibodies in a buffer with preservatives. During incubation, the conjugate of alkaline phosphatase with monoclonal mouse anti-human antibodies is associated with a complex of paramagnetic particles and SARS-COV-2 antibodies. Microparticles are captured by a magnet, while unrelated substances are removed by washing.

The second stage: a solution of the substrate is added to the reaction cell. The decomposition of the substrate is catalyzed by the conjugate of alkaline phosphatase with monoclonal mouse anti -human antibodies of the immunocomplex, which

remained on microparticles. The resulting chemilyuminescent reaction is measured in relative light units (s) using a built -in photographic engineer. The amount of SARS-COV-2 antibodies in the sample is proportional to the number of relative light units (OSA) formed during the reaction. The concentration of SARS-COV-2 antibodies is determined by a calibration curve.

Determination of tnf -α, il -1β , il -2, il-6

The first monoclonal antibodies (MKKTA) are previously immobilized on the internal surfaces of solid tablets for ELISA. 100 μl of standards are introduced in the first two vertical series of cells of the tablets: A-0 PG/ml of the studied cytokine, B-50 pg/ml, C-250 pg/ml, D-500 pg/ml, E-1000 pg/ml, F - 2000 pg/ml of cytokines. The remaining cells are added to 100 pg/ml of samples. Samples and standards are made in recommended buffers. The tablet is incubated for 1.5 hours at 18-20 ° C. After incubation, the solution from cells is removed using a pipette or vacuum pump. Then the cells are washed three times by introducing 300 μl of the flushing solution to each of them. The remains of the flushing solution are removed using a pipette or vacuum pump. The second Makkat, laundered by biotin, introduce 100 μl each and incubate samples with them for 1.5 hours with continuous shaking at 18 ° C. After incubation, the solution from the cells is removed with the help of a pipette or a vacuum pump. The cells are washed three times by introducing 300 μl of the flushing solution to each of them. The remains of the flushing solution are removed using a pipette or vacuum pump. The strapavid conjugate with a crap peroxidase diluted 1: 100 buffer is introduced at 100 μl to all tablets and incubated at 18 ° C and continuous shaking for an hour. After incubation, the solution from cells is removed using a pipette or vacuum pump. The indicator mechanism in this test is a high affinity for biotin, which is conjugated with the second MKAT used in the test. After that, the stages of washing and coloring are carried out.

Measurement of the level of cytokines. In this work, solid -phase immunoform methods that gained the most widespread were used to determine the level of cytokines in blood serum. These systems use sets of several antibodies. As

the first antibodies, monoclonal antibodies (mat) are used, which are assembled on 96-light tablets and have the ability to capture antigen (cytokine) from the solution. As the second antibodies, biotilized polyclonal antibodies (PAT) were used, which "open" the streptavidin-farment-fraud complex. It is also possible to use sets of three antibodies, when the second polyclonal antibodies "open" with anti -ivide antibodies condested with enzymes. As a result, a "sandwich" is formed from two or three antibodies and antigen molecules between them. A quantitative assessment of the results was carried out by comparing the results with the dependence curve of the optical density of the solution on the concentration of a standard antigen. For the calculation, a linear section of the standard curve is used.

The infection after the coronavirus infection SARS-COV-2 (Covid-19) can also be detected indirectly-by measuring the owner's immune response to the SARS-COV-2 virus. Serological diagnosis is especially important for patients who can seek help after twelve weeks from the onset of the disease. Serological diagnostics is an important tool for assessing the prevalence of the coronavirus infection SARS-COV-2 (COVID-19) in the community and identify people who are immunized and potentially "protected" from infection. Serological studies are appropriate:

-for diagnostic purposes: if the PCR research was not carried out or gave a negative or indefinite result, with a persistent suspicion of COVID-19 (determination of IgM, IgG, IGA);

- to assess the level of antibodies to the virus in medical personnel working with patients COVID-19 (determination of IgM, IgG, IGA);

- in epidemiological studies: to examine the population in order to determine the share of ill, who have undergone an infection without symptoms that did not contact the pathogen (determination of IgG);

- when developing, testing and monitoring the effectiveness of vaccines (IGG determination);

- The results of serological tests help to identify potential donors of recruiting plasma.

2.2.3 Spectrometric analysis of the microelene composition of the hair

In the framework of our scientific research, we carried out a spectrometric analysis of the hair in order to determine changes in the microelene status of the body, possibly entailed dermatological manifestations.

Currently, several methods of measuring and identifying microelements are used: spectrometric or spectrographic method, nuclear-magnetic resonance method, radioisotope method, Ionometry method, method of cellular cultures and model of intact animals grown on media and diets, which are specially depleted by separate microelepers, method Ion exchange compounds and helators.

In our study, a spectrometric analysis of biological materials on the nuclear reactor of VVR-SM in IAF Ruz in the Laboratory of Ecology and Biotechnology (under the leadership of Doctor of Tquetics of B. Kurbanov) was carried out in our study to study the microelene status.

For analysis, they used patients of patients. The hair fence was carried out from the occipital area of the head, from roots up to 3 cm long weighing 150-200 mg. Tattered hair was placed in a vacueter that marked with the patient's data, as well as the dates of the fence. The spectrometric analysis was carried out in the 2nd stages: at the first stage, the hair was exposed to a stream of neutrons $6 \cdot 10^{13}$ neutr $\cdot$ cm $^{2} \cdot$ s $^{-1}$ with an exposition of 15-20 s, followed by measurement of radioactivity. The second stage of irradiation was performed after 2-3 daily break, a stream of neutrons with similar characteristics within 20 hours with the subsequent measurement of γ-spectrum samples using gamma spectrometer. The gamma spectrometer has the following technical characteristics: the sensitivity of Germany detectors 120 cm ^{3}, an energy resolution of 1.8 KEV, and 1330 KEV in γ line. In order to analyze the data, the Genie 2000 program was used. A detailed description of the methods for determining the microelene composition of the hair is given in Danilova E.A. And co -author., and bug L.I. et al.

A comparison of the received data on the quantitative and qualitative analysis of microelements was carried out with reference values for the population of the

Republic of Uzbekistan, adopted by the Institute of Nuclear Physics of the Academy of Sciences of the RUZ.

§2. 3. Methods of statistical analysis

In order to highlight the general factors, a factor analysis with the establishment of the share of each feature that has an impact on the course of the disease; To establish the differences - the criterion of the angular transformation of Fisher (f *), the criterion c Pieron's Oblast, the criterion of relative risk (Relative Risk - RR).

In a comparative analysis of the average values, in order to identify statistical differences, the criterion of Stuent was applied. In order to identify statistical differences between categorical indicators, a conjugation table was used with the definition of χ^2 Pirson, and with the number of observations <5 - the exact criterion of the probability of Fisher.

Indicators of the statistical reliability of the differences between the compared groups were evaluated as inaccurate in the indicators P> 0.05, the limit - p <0.05, the average - p <0.01, high at the value of p <0.001.

All statistical processing was carried out using the SPSS For Windows Version 17.0.1 program (SPSS Inc., Chicago, IL).

Chapter III.Features of the clinical course of dermatological manifestations, microelene and immunological statuses after a coronavirus infection (Covid-19)

§3.1. Features of the clinical course in patients with dermatological manifestations after a coronavirus infection

If the dermatological manifestations of viral infections such as measles, rubella and other diseases are well studied and have specific skin rashes, then specific dermatological manifestations after a coronaviral infection are at the study stage. Scientists from around the world constantly describe, systematize and study periodically manifest dermatological rashes in patients after undergoing coronavirus infection (covid -19) (sars - cov -2). Until now, scientists from many countries conducted a number of clinical studies devoted to the study of dermatological manifestations after coronaviral infection.

To date, the following forms of the dermatological Changes at Covid -19 (Sars - Cov -2): Papulomoic skin todges, polymorphone -dermal, hemorrhagic, lvedo), acrooderma, papula -visyculous rashes, papula-screed rashes (and pink lichee of the Giber), a brown-like rash, toxicoderma. We do not exclude the likelihood of some dermatological manifestations as a response to treatment (antiviral drugs, the use of hydroxychlorochin, anticoagulant therapy, etc.) [36, p. 103].

As noted earlier, out of 108 (100.0%) patients who have undergone coronavirus infection in 47 (43.5%) dermatological manifestations, not was found, and in 61 (56.5%) dermatological manifestations of various Forms.

We discovered the following dermatological manifestations after a coronaviral infection:

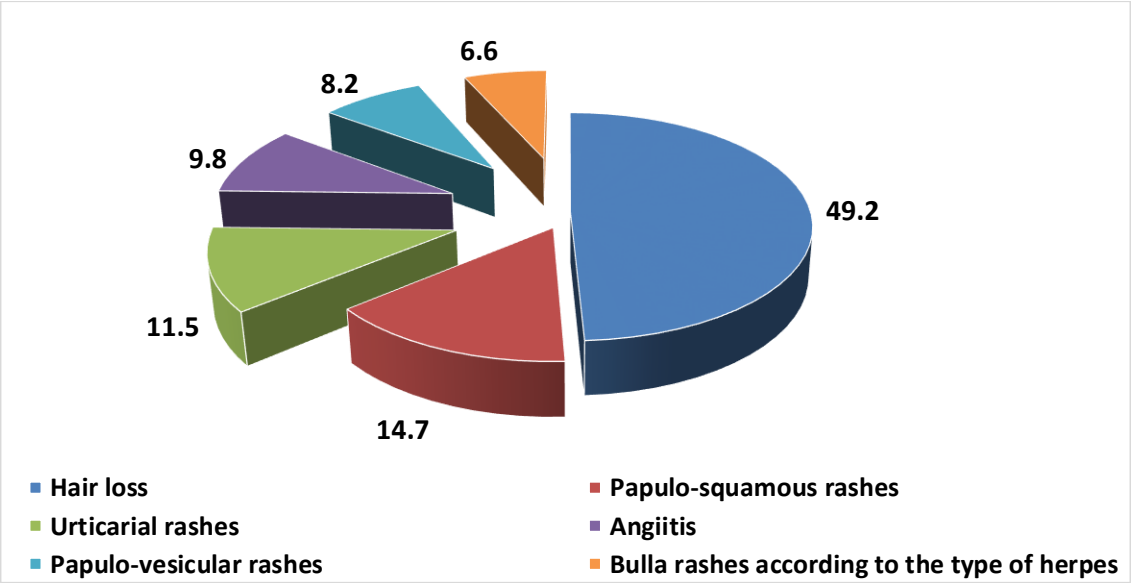
- Hair loss - 30 (49.2%) patients: of which nesting alopecia - 15 (13.9%); and diffuse alopecia - 15 (13.9%);
- Papulo-squamous rashes in 9 (14.7%) patients, of which psoriasis in 5 (4.6%), red flat lichen (KPL)- in 2 (1.9%), pink lichee of the GIBER - in 2 (1.9%);

- Urticarial rashes in 7 (11.5%) - urticaria;

- rashes according to the type of angiite in 6 (9.8%)- acrodermatitis 2 (1.9%), polymorphic dermal iritis 2 (1.9%) and papulo-nodular angiitis 2 (1.9%);

- papulo-vesicular rashes in 5 (8.2%): allergodermatitis in 3 (2.8%) and eczema 2 (1.9%);

- bulla rashes according to the type of herpes in 4 (6.6%); Simple bulla lichen in 2 (1.9%), girling lichen in 2 (1.9%) patients (Fig. 3.1).



Rice. 3.1. The structure of dermatological manifestations after a coronaviral infection

In the clinical course of dermatological manifestations after a coronavirus infection, we observed the following features.

In the post -shaped period, the appearance of bubble elements was noted according to the type of herpes, which are mainly characterized by an atypical arrangement in the lips, sometimes double -sided, lack of a tendency to relapse and painless.

While with simple bubble lichen painful bubble elements; Grouped on an erythematous background are localized around the nose, mouth and conjunctiva - with simple bubble lichen and in the area of the lower ribs, in the form of a wide strip on one side of the body with gurgling lichen, patients experience pain and burning.

Papulo-Vesicular rashes after a coronaviral infection were common, atypical location in the sternum, abdomen and back, and also observed erosive papules, unlike allergodermatitis, in patients who did not suffer coronavirus infection, elements were often localized on the limbs, was noted. Strong itching.

With urticaria, the morphological element in the form of urticaries occurs immediately and usually passes after 20-30 minutes, but in our studies we found that the urticar elements were with an atypical course, we were persistent with a long common process.

The morphological element in the form of post-shoe rashes according to the type of acrodermatitis in our studies was very rare in 2 (1.9%) and was characterized by the appearance of an itchy papules of the papules of red-located reddish-purple color on the skin of the feet and fingers, which were transformed into hemorrhagic bubbles with the formation of burgundy Black crusts, and rashes for acrodermatitis mainly affect the nail phalanx of the fingers and feet. The primary element-uninterous oval pustules sprinkle symmetrically.

Morphological elements for psoriasis, as well as pink lichee of the Giber, have a mother plaque, usually do not itch, unlike manifestations in the post -shaft period, where the absence of a mother's plaque is noted and is characterized by severe itching in almost all patients. In our work, dermatological manifestations in the form of papula-screed rashes were common, and the damage to the joints in 5 (4.6%) patients out of 9 was noted.

Next, we want to share our experience in the diagnosis, treatment and observation of patients with dermatological manifestations after coronavirus infection (covid -19).

The most frequent dermatological manifestation after a coronavirus infection was hair loss.

Hair loss was found in 30 (49.2%) cases. It arose on average after seven to eight weeks, and sometimes 12 weeks after recovery.

Analyzing, distribution on a sexual basis should be noted that more often hair loss was found in 22 (20.4%) women since they are more attentive to their appearance and pay attention to hair loss compared to men 12 (11.1%) .

In the prevailing majority of cases, nesting alopecia was observed - 15 (13.9%), which followed the diffuse 15 (13.9%). In addition, there were differences in the degree and localization of the lesion depending on the floor. So women observed the foci of baldness in the occipital and temporal region, while in men of the parietal and temporal areas (Fig. 3.2).

In 2 (1.9%) there were acroodermatitis of the fingers and legs (Fig. 3.3). In this category of patients, the appearance of red purple spots on the fingers was observed, against the background of pallor of the skin of the hands .

Rashes of the type of acrodermatitis - were characterized by the appearance of yellowish papules, purple - red, bright pink on the surface of the skin of the palms or legs.

A. Patient W.Sh. 25 years. B. Patient V.K. 19 years old

Rice. 3.2. Diffuse alopecia (post -shaped)

In some cases, diffuse leather erythema, painful hyperemic foci on the skin of the feet and hands appeared to add to the papules.

Rice. 3.3. Patient S.M. 34 years. Acrodermatitis (post -shaped)

Over time, the papules transformed into hemorrhagic bubbles, which, referring, formed a crust of black or dark brown. For clarity, we give clinical examples.

Clinical example No. 1

Patient I. S. 1989 AMB. Map No. 327. I complained about painful rashes on my palms, a burning sensation. The disease began with pain throughout the body. I did not contact the doctors about this pathology. 6 days ago, a burning sensation appeared on the fingers, which gradually intensified. Dark red spots of various sizes appeared. The use of ointments and creams did not lead to improvement.

Rice. 3.4. Patient I.S. 33 years. A/k No. 327 Ladomary dermatitis (post-shoe)

I addressed us with the above complaints on 02.22.21, the patient was examined in the Samarkand regional skin and venereological dispensary.

With an objective examination on the surface of the skin of the palm, there are papules, vesicles against the background of diffuse skin erythema. The rashes cover the fingers of the hands, the soreness is noted with the difficulty of bending the fingers (Fig. 3.3).

The patient in the history of the transferred coronavirus infection in November 2020.

Diagnosis: Acrodermatitis (post -shoe) Soput.: Anemia of a mild degree.

The patient was on outpatient treatment.

OAM- hemoglobin- 116,0 g/l ; red blood cells - 4.4 × 10^{12} /l ; platelets - 248.0 × 10^{9} /l; white blood cells - 7,3 × 10^{9} /l; P/I-2,4 ; s/I - 56.1; Eosinophils - 3.4%; lymphocytes - 35.4%; monocytes - 2.8%; ESR - 7.8 mm/h .. biochemical blood test - without pathology. Coagulogram- Protrombin index-110% (norm 90-105%), plasma tolerance to heparin 10 minutes. (norm 8-10 min), plasma fibrinogen 5.5 g/l (norm 2.0-4.0 g/l), fibrinolytic activity 220 minutes. (norm 140-240 min.)

Hair analysis for the content of trace elements: ME-high content of bromine-5.6 μg (Norma-2,9 μg), chlorine-2100 μg. (norm-1530 μg), moderate reduction in iron-23 μg. (norm-36.2 μg.) and copper- 20.0 μg. (norm- 29.0 mcg.). A pronounced zinc deficiency - 95 μg. (norm- 187 μg.). The remaining indicators within the lower boundaries of the norm.

The patient was treated: Levamisol-150 mg. 1 tablets 1 time per day, for 3 days. Immunocink-25 mg. 1 tablets 1 time per day, since the patient had a pronounced deficit of the zinc microelement: zn -95 μg. (Norma 187 μg.); Complete 1 tablets 1 time per day, within 4 weeks; Clexan 0.4 p/c near the navel, 1 time per day.

On the second day, there was a decrease in a burning sensation on the palms and the disappearance of pain. The patient was under supervision and received outpatient treatment until 03/27/21. Currently, there are no signs of the disease.

Under our observation were 2 (1.9%) patients with rashes of the type of acrodermatitis .

Most patients before our help were treated in specialized centers for coronavirus infection. In this connection, in most patients who turned to us for help, clinical and laboratory indicators had normal indicators: hemoglobin- 116,0 g/l ; red blood cells - 4.4×10^{12} /l ; platelets - 248.0×10^{9} /l; white blood cells - $7,3 \times 10^{9}$ /l; P/I-2,4 ; s/I - 56.1; Eosinophils - 3.4%; lymphocytes - 35.4%; monocytes - 2.8%; ESR - 7.8 mm/h. In addition to changes in immunograms and coagulograms. To restore the picture of the disease, we carefully studied these extracts from those centers where patients received treatment.

Rice. 3.5. Patient D.O. 44 years. Angight Polymorphic dermal (post -shaped)

Angiaths - were characterized by the appearance of erythematous and pethemical rashes, papules, in places merging into plaques, in the region of the sternum, under the mammary glands, in the inguinal fold, as well as on the upper and lower extremities (Fig. 3.5; 3.6).

Clinical example No. 2

Patient I.R. 65 years. And/B No. 1125 turned to us on multiple rashes over the entire surface of the trunk.

He considers himself sick for 5 days, when papulo-scabbits began to appear (Fig. 3.6) . The patient began to be treated independently at home. He took "folk" means - garlic, honey, raspberry jam.

Rice. 3.6. Patient I.R. 65 years. and/b No. 1125. Papulo-Nodular angiite (post-shoe)

The patient turned to the clinic at the place of residence. The district therapist appreciated his condition as medium severity, due to dermatological pathology and sent to the Samarkand regional skin and venererological dispensary. The patient in the history of the transferred coronaviral infection in Juica l e 2020.

When applying on October 5, 2020, the general condition is satisfactory, the complaints were dermatological rashes. On examination: erythematous rashes, papular elements of bright red color are noted, in places merged into plaques in the front and posterior surface of the body, as well as slight peeling (Fig. 3.6).

The patient was on outpatient treatment.

A clinical and biochemical study was conducted: it was noted nv-88 g/l, er. - 3.1 x 10 ^{12}., Thrombus. - 52.2 x 10 ^{6}. Leukocytes. -15.0 x 10 ^{9}., Stick -core

neutrophils -1%, segmented neutrophils -38%, eosinophils -0%, basophiles -0%, mononocytes -1%, ESR -22mm/h.

OAM - without features. Biochemical blood test - without pathology. Coagulogram- Protrombin index-115% (norm 90-105%), plasma fibrinogen (norm 2.0-4.0 g/l), fibrinolytic activity 220 min. (norm 140-240 min.).

Hair analysis for the content of trace elements: ME-high content of bromine-6.6 μg (Norma-2,9 μg), chlorine-2300 μg. (norm-1530 μg), moderate reduction in iron-31 μg. (norm-36.2 μg.) and copper- 22.0 μg. (norm- 29.0 mcg.). A pronounced zinc deficiency - 88 μg. (norm- 187 μg.). The remaining indicators within the lower boundaries of the norm.

The patient has a diagnosis: tonsillum of papulo-nodular (post-shoe). Soput.: Anemia of moderate severity.

The patient was treated: Levamisol-150 mg. 1 tablets 1 time per day, within 3 days with a break of 2 weeks; Immunocink-25 mg. 1 tablets 2 times a day, since the patient had a pronounced deficit of a zinc microelent: zn -95 μg. (Norma 187 μg.); Complete 1 tablets 1 time per day, within 4 weeks; Locally use the ointment "Diprosalik".

Under our observation were 9 (14.7%) patients with papula-screed rashes. A characteristic feature of these rashes was the absence of maternal plaques, rapid progression, and a predominant damage to the skin of the body. In clinical and biochemical analyzes, anemia, leukopenia, thrombocytosis, a change in liver indicators of blood, a tendency to hypercoagulation were noted. Low indicators of trace elements such as copper, selenium and zinc.

Urticar rashes - characterized by the appearance of generalized foci, urticar elements of pink, dense consistency, edematous, surrounded by white or red rim. Elements of various sizes, sometimes merged, forming large round or polycyclic forms. Urticar elements had a tendency to constantly change the brightness of color and size, as well as localization. Itching was worried (Fig. 3.7.).

Clinical example No. 3

Patient H.B. 35 years notes the itching of the skin, combing the skin causes unpleasant sensations, to pain. He feels relief under the fan or under a stream of cold air. From the anamnesis at the end of January it was transferred and treated for coronavirus infection.

Rice. 3.7. Patient H.B. 35 years. A/K No. 2713. The same urticaria (post - shaped).

Epidemiological history: the spouse is under treatment at a specialized center for the treatment of coronavirus infection, was hospitalized 26 days ago with acute bilateral pneumonia.

When examining the foci, urticar elements of pink, dense consistency, edematous, surrounded by a white rim are noted. Urticaria of various sizes, in some places merge, forming large polycyclic forms (Fig. 3.7).

The patient was on outpatient treatment.

A clinical and biochemical study was conducted: it was noted nv-92 g/l, er. - 3.7 x 10^{12}., Thrombus. - 43.2 x 10^{6}. Leukocytes - 16.0 x 10^{9}., Stick -core neutrophils - 1%, segmented neutrophils -38%, eosinophils - 0%, basophili - 0%, lymphocytes - 12%, mononocytes - 1%, ESR - 18 mm/h.

OAM - without features. Biochemical blood test - without pathology. Coagulogram- Protrombin index –116% (norm 90-105%), plasma fibrinogen 5.5 g/l (norm 2.0-4.0 g/l), fibrinolytic activity 220 minutes. (norm 140-240 min.).

Hair analysis for the content of trace elements: ME- High content of bromine-5.6 μg (Norma-2,9 μg), chlorine-2100 μg. (norm-1530 μg), moderate reduction in iron-23 μg. Norma-36.2 μg.) and copper- 20.0 μg. (norm- 29.0 mcg.). A pronounced zinc deficiency - 120 μg. (norm- 187 μg.). The remaining indicators within the lower boundaries of the norm.

The patient was treated: Levamisol-150 mg. 1 tablets 1 time per day, for 3 days. Immunocink - 25 mg. 1 tablets 1 time per day, since the patient had a pronounced deficit of the zinc microelement: zn - 120 μg. (Norma 187 μg.); Complete 1 tablets 1 time per day, within 4 weeks; Eden 5 mg 1 tablets 1 time per day, in the evening, for 10 days.

Under urticar rashes, a pronounced zinc deficiency was noted, in connection with which, we prescribed an immunocink. After the start of treatment on the ninth day, the complete disappearance of rashes was noted.

Under our observation were 7 (11.5%) patients after a coronavirus infection, the dermatological manifestations of which were in the form of urticar rashes . In these patients, the only manifestation after the coronaviral infection was rashes in the form of urticaria. A characteristic feature of urticar rashes was rapid progression, the predominant damage to the aral surfaces of the body (Fig. 3.8).

In clinical-biochemical analyzes, anemia, an increase in ESR, a high content of bromine, chlorine, selenium, a moderate decrease in iron and magnesium during a spectrometric hair analysis were noted.

Papulo - Vesicule rashes - were characterized by clinical symptoms, the appearance mainly on the body of papules (with erosion and without), as well as the appearance of multiple vesicles (Fig. 3.9).

Rice. 3.8. Patient H.G. 28 years. ***Chronic recurrent urticaria*** **(post -ovid)**

Rice. 3.9. Patient J.Kh. 47 years old. a/c No. 1303 . ***eczema*** **(post -shaped)**

The vesicles were oval, in the form of a dome, sometimes a flat shape. Papular The rashes were miliary, lenticular and numolar. Vesiculas were characterized by the appearance of bubbles with serous contents. Papulo-Vesicular rashes were arranged in groups in certain areas of body skin.

Clinical example No. 4

Patient J.Kh. 47 years old. A/c No. 1303 applied for outpatient assistance on 02.02.2021 with complaints of small rashes throughout the body. She turned to the Samarkand regional skin and venereological dispensary for advice.

Epidemiological history: was in a specialized center for the treatment of coronavirus infection at 07.12.2020.

On examination, many vesicles are noted. Vesicula of oval shape. Some bubbles with serous and serous-hemorrhagic contents (Fig. 3.9).

The patient was on outpatient treatment.

OAM - without features. Biochemical blood test - without pathology. Coagulogram- Protrombin index –111% (norm 90-105%), plasma fibrinogen 5.3 g/l (norm 2.0-4.0 g/l), fibrinolytic activity 220 minutes. (norm 140-240 min.).

Hair analysis for the content of trace elements: ME-high bromine content-4.6 mcg (norm-2,9 μg), chlorine-1900 μg. (norm-1530 μg), moderate reduction in iron-21 μg. (norm-36.2 μg.) and copper- 21.0 μg. (norm- 29.0 mcg.). A pronounced zinc deficiency - 102 μg. (norm- 187 μg.). The remaining indicators within the lower boundaries of the norm.

The patient was made a diagnosis: eczema (post -shoe). SOP.: Anemia II degree.

The patient was treated: Levamisol-150 mg. 1 tablets 1 time per day, within 3 days with a break of 2 weeks (course 2 times); Immunocink-25 mg. 1 tablets 1 time per day, since the patient had a pronounced deficiency of the zinc microelement: zn - 102 μg. (Norma 187 μg.); Complete 1 tablets 1 time per day, within 4 weeks; Locally ointment Lorinden S.

On the fifteenth day, the complete disappearance of rashes is noted.

Papulo-Vesicular rashes were found in 5 patients (8.2%). The clinical feature of this type of rashes after a coronavirus infection was the vastness of the lesion, more often against the background of sweating and anemia, lymphocytosis, leukopenia, an increase in urea, creatinine and general nitrogen of blood were noted. In addition, a high content of calcium, chlorine, chromium, a moderate decrease in zinc, selenium, copper, iron and magnesium were noted.

Bubble rashes according to the type of herpes were found in 4 patients (6.6%) and were characterized by the appearance of small bubbles, against the background of edematous and hyperemic skin, which preceded Itching and burning of the skin. The contents of the bubbles were more often serous, and later - the hemorrhagic contents of the vesicles were noted. Bubble rashes like herpes were more often observed around the lips and in 2 cases, like an encircling losing in the lower ribs (Fig. 3.10). Often the bubbles spontaneously opened, forming erosion covered with hemorrhagic crust.

Clinical example No. 5

Patient B.Sh. 35 years. And/b No. 3724. He turned after 13 weeks 19.10.20. After the treatment of coronavirus infection. Small painful rashes appeared on his back, due to the rapid spread of rashes, he turned to the Samarkand regional skin-venereological dispensary.

On examination - complaints about painful rashes in the right half of the chest, mainly on the rear surface (Fig. 3.10.b). Rashes in the form of bubbles of various sizes, some have purulent contents. In places, the bubbles merged, forming large foci. Body temperature is subfebrile. The patient was on outpatient treatment.

OAM - without features. Biochemical blood test - without pathology. Coagulogram - without pathology.

Hair analysis for the maintenance of trace elements: ME-high content of bromine-4.6 μg (Norma-2,9 μg), chlorine-1900 μg. (norm-1530 μg), moderate reduction in iron-21 μg. (norm-36.2 μg.) and copper- 21.0 μg. (norm- 29.0 mcg.). A pronounced zinc deficiency - 102 μg. (norm- 187 μg.). The remaining indicators within the lower boundaries of the norm.


A


b

Rice. 3.10. Patient B.Sh. 35 years. and/b No. 3724

Drinking lichen (post -shoe)

Diagnosis: encircling lichen (post -shoe).

The patient was treated: Levamisol-150 mg. 1 tablets 1 time per day, for 3 days; Immunocink-25 mg. 1 tablets 1 time per day, since the patient had a pronounced deficit of the zinc microelent: zn - 102 μg. Norma 187 μg.); Complete 1 tablets 1 time per day, within 4 weeks; Locally a solution of fucortine, with pain with anesthesin, Zovirax 200 mg every 4 hours 5 times a day for 10 days, subsequently 400 mg 2 times a day.

Clinical recovery was noted 18 days after the start of treatment.

Bubble rashes according to the type of herpes after a coronaviral infection on the clinical manifestations did not differ from the usual simplex of herpes.

Of the laboratory data, lymphocytosis, an increase in ESR, monocytosis, an increase in asate and creatinine were characteristic. A moderate increase in magnesium, bromine and iron was also noted.

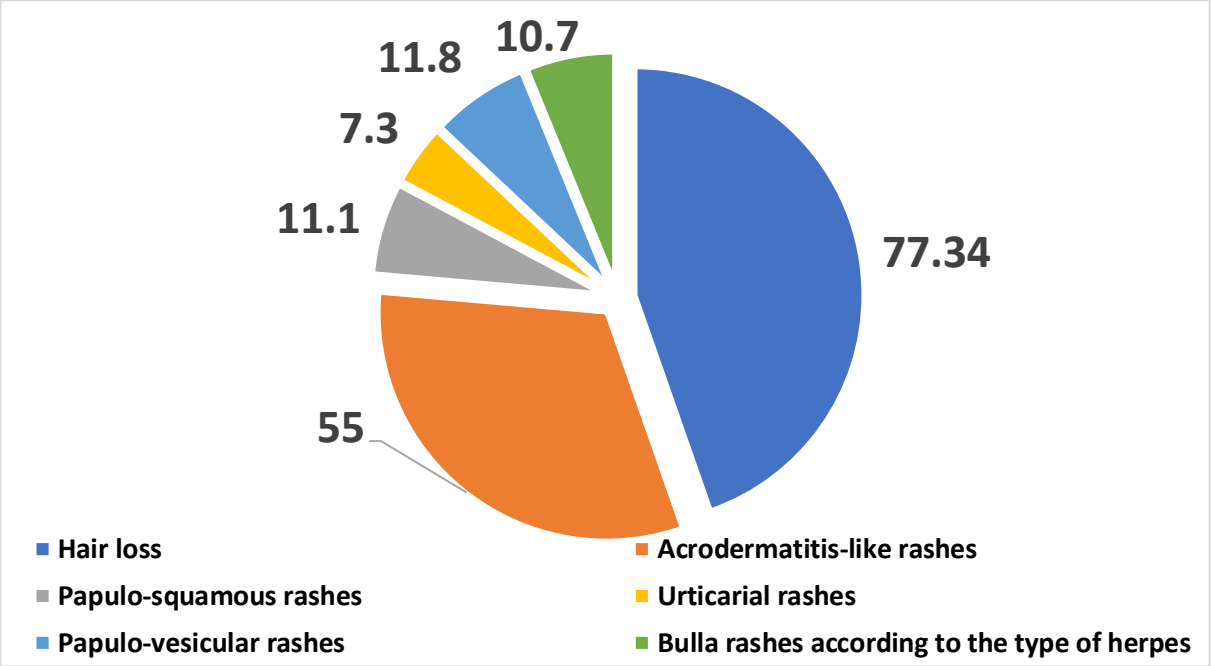


Figure 3.11. The terms of the appearance of dermatological manifestations after a coronaviral infection (day).

Dermatological manifestations after a coronaviral infection had a different duration (Fig. 13.11.). The longest dermatological changes were observed with hair loss.

Table 3.1

Features of dermatological manifestations after a coronaviral infection, according to the study

Dermatological manifestations after a coronavirus infection	Clinical analysis of morphological elements of dermatological manifestations
Focal alopecia (post - shaped)	Swanting or diffuse hair loss in which the parietal, temporal and occipital areas are most often affected.
Skin todges	Red-violet spots on the fingers. Itching with subsequent peeling of the skin. It is characterized by the appearance of the papules of yellowish, purple-

	red, bright pink color on the surface of the skin of the palm or feet. In some cases, diffuse leather erythema, painful hyperemic foci on the skin of the feet and hands join the papules. Over time, the papules are transformed into hemorrhagic bubbles, which, referring, form a crust of black or dark brown.
The angiite is polymorphic	They are characterized by the appearance of papules, among the merging paples, plaques form, pink, which were noted in the lower extremities, in the area of the legs, sternum, in the abdomen, in the inguinal fold. Symmetry of the lesion is observed.
Hives	A rare localization- palms. The subacute nature of the course is developed, in some cases it is proof-like intensively increased and decreases after the developed therapy. They are characterized by the appearance of generalized foci of urticar elements of pink or pale red color, dense consistency, edematous, surrounded by white or red rim. Elements of various sizes, sometimes merge, forming large round or polycyclic forms. Urticaria tend to constantly change color brightness and size, change localization. Itching appears.
Allergodermatitis	There is a tendency to group in certain areas of body skin. Characterized by acute clinical symptoms, the appearance of mainly on the body of papules, as well as the appearance of multiple vesicles. Vesiculas are oval elements, in the form of a dome, sometimes a flat shape. Vesiculas are characterized by the appearance of bubbles with serous and serous-hemorrhagic contents.
Simple bubble lichen	Bubble rashes according to the type of herpes are mainly observed around the lips, in the genitals and in the lower ribs. It is characterized by the appearance of small bubbles, against the background of edematous and hyperemic skin, which is preceded by itching and burning of the skin. The contents of the bubbles are often transparent, and later with purulent hemorrhagic contents. In the future, the bubbles spontaneously open, forming erosion, covered with a dark crust.

At the further stage, we revealed dermatological features of manifestations after a coronavirus infection on the analysis of morphological rashes, the data obtained are presented in table 3.1.

If dermatological manifestations after a coronaviral infection indicate a predominant lesion of certain organs and systems, then the duration of the disease indicates the severity of the course of dermatological manifestations and the general reactivity of the patient's body. To determine the relationship of dermatological

manifestations of infection and the duration of the disease, we analyzed the duration of the course, depending on the type of dermatological changes.

In some cases (in 1 patient), an acrodermatitis rash continued after a clinical recovery of up to two months. The rest against the background of developed therapy took place within two weeks.

§3.2. Features of the microelene status in patients with dermatological and prophenomena I m and after the coronavirus infection (covid -19)

In the last three decades, a huge number of publications about trace elements have been a turn in understanding the mechanisms of trace elements and their roles in the processes of growth, proliferation and death of cells. Understanding these mechanisms allows you to develop new therapeutic methods and improve existing treatment protocols. Microelements (ME) are a unique group of compounds that have a close connection with the processes of immunogenesis, immunopathological processes.

The fence of the material, namely, the hair from the occipital area of the head for spectrometric examination was carried out with the consent of patients in the examination process. The material was placed in a vacueter. In the marking indicated F.I.O. The patient, age, gender, date of receipt of the sample and sent to IAF AN RUZ.

All patients were determined by ME before and 2 weeks after the clinical recovery. In most patients, a decrease in the number of such immunomodulating essential ME as zinc, selenium, iron and increased content of chlorine and bromine (Table 3.2) was noted.

Selenium deficiency in people is defined as hair loss, bleaching or fragility of nails or two or more of the following symptoms: muscle or joint pain, headache, unpleasant odor from the mouth, fatigue/weakness, gastrointestinal symptoms or skin rash. Vitamins A, B, D, Selenium, Zinc and Copper due to its complementary and synergistic effects allow components of congenital and adaptive immunity to counteract infections similar to infections that occur in the respiratory traces.

According to data presented in table 3.2, it can be noted that an increase in elements such toxic for immunity as chlorine, in the body of patients with dermatological manifestations after coronaviral infection (covid -19) due to the use of disinfectants The wearing of gloves will subsequently contribute to the development of inflammatory processes of the skin, characterized by the development of dry skin, cracks, and changes in the pH of the medium. In the comparison group, there was a decrease in zinc content by 21.1% and by 39.8% - copper in the main group.

As you know, compounds containing chlorine penetrate mainly through respiratory organs, digestive tract and intact skin. In our case, the chlorine content in the main group increased by 36.4%, this is due to the fact that during the pandemic, the skin was repeatedly exposed to chlorine -containing disinfectants.

In these patients through damaged skin chlorine in large quantities, which caused an increase in chlorine in biological material. The toxic effects of chlorine are due to the appearance of various acids, which are formed during its hydrolyzing.

Table 3.2

The average indicators of the content of trace elements in the hair among patients who have undergone coronavirus infection (ICG)

Microelements	Control group (n = 30)	Reference group (n = 47)	The main group (n = 61)
Calcium, mcg	1720.0 ± 25.3	1971.4 ± 22.7 ***	1883.6 ± 24.7 ***
Potassium, mcg	1250.0 ± 19.1	1204 ± 17.2	1164.3 ± 8.7 ***
Sodium, mcg	632.0 ± 12.1	615.4 ± 10.9	721.9 ± 11,1 ***
Chlorine, mcg	1530.0 ± 16.0	1479.3 ± 18.1*	2087.5 ± 18.9 ***
Iron, mcg	36.2 ± 2.3	34.7 ± 0.75	17.9 ± 0.44 ***
Zinc, mcg	187.0 ± 8.3	177.6 ± 5.6 ***	172.4 ± 2.24 ***
Copper, mcg	29.0 ± 1.1	22.7 ± 0.75 ***	17.3 ± 0.2 ***
Manganese, mcg	0.35 ± 0.05	0.6 ± 0.04 ***	0.75 ± 0.089 ***
Cobalt, mcg	0.09 ± 0.01	0.084 ± 0.005	0.080 ± 0.02
Chrome, mcg	0.7 ± 0.03	0.63 ± 0.03	0.31 ± 0.01 ***

Selenium, MKG	0.6 ± 0.04	0.73 ± 0.02 **	0.28 ± 0.018 ***
Iodine, mcg	1.7 ± 0.08	1.57 ± 0.06	0.84 ± 0.08 ***
Brom, mcg	2.9 ± 0.6	2.1 ± 0.14	3.90 ± 0.15

Note:* - the differences regarding the data of the control group are significant (* - p <0.05, ** - p <0.01, *** - p <0.001);

In addition to the damage to the mucous membranes by chlorine and its derivatives, even chlorine compounds lead to the activation of neutrophils: hydrogen peroxide, hydroxyl radicals, nitrogen oxide are formed, which leads to a "respiratory explosion". Edema, inflammation, spasm of muscles, dysfunction of the vessels of the respiratory tract are developing. Chlorine also interacts with antioxidants such as glutathione, ascorbic acid, etc. A2 phospholipases, whose activity increases under the influence of chlorine, leads to damage to the surfacttant and can lead to the development of a respiratory distress syndrome. The main reason for the accumulation in the body of the bromine is the uncontrolled intake of bromic-containing drugs, such as Valocordin and Corvalol.

On the contrary, such Essential MEMMUs as, Zn, I, Cu, Co, CR, SE, MN, FE were lower than norm or in the lower boundaries of the norm.

The most popular trace element used in the treatment of coronavirus infection - zinc, has a number of biologically active properties. Zinc is part of most enzymes.

Copper is necessary to maintain normal skin (elastin), also increases the body's resistance to infections, has a pronounced anti -inflammatory property.

As you know, the lack of iron can be the cause of anemia, as well as the polymorphism of transferorin and the hemochromatosis gene. The disadvantage of selenium gives mutations glutathioneperoxidase, polymorphism of the genes of the blood coagulation system and lipid metabolism. There are so low reference indicators of content in the body and under other essential trace elements.

There can be several options: firstly, these patients have the initial violation of the content of these elements, and secondly, the infection violating the Metabolism microelements leads to a change in the latter, and the third option, the infection in combination with intensive care leads To these changes. To identify the

possible connection of dermatological manifestations with an imbalance in the body of trace elements, an analysis was carried out between these indicators.

We have been made Correlation Analysis between the level of MA and clinical indicators. The high calcium content increases the risk of blood clots, since, the participation of this element in the hemostasis system is well known.

According to the presented data in patients with dermatological manifestations of those who had undergone covid -19, an infection observed a reliable increase in the level of calcium, sodium and chlorine ($p < 0.001$), respectively. Their greatest value was observed in patients with urticaria. In patients with hair loss, a reliable decrease in the level of iron, zinc ($p < 0.001$), as well as copper and chromium and selenium ($p < 0.05$), respectively. The same changes were observed with acrodermatitis, papula-vesicular rashes and herpetic rashes, and with the latter there was also a iodine deficiency of up to 1.1 ± 0.2 μg ($p < 0.05$), respectively.

An interesting picture was observed in patients with papula-screed rashes. In this group of patients, a reliable decrease in the level of potassium, iron, zinc, copper ($p < 0.001$), and the level of selenium and iodine ($p < 0.05$), respectively, was observed. In patients with urticaria, in addition to the above changes regarding papulo-scabs, there was a significant decrease in chromium level to 0.28 ± 0.07 ($p < 0.001$), respectively.

Thus, in all patients with dermatological manifestations in the post -shoe period there is a deficiency of iron, zinc, copper and selenium. Moreover, the lowest indicators in all patients with dermatological manifestations in the post -shaped period we observed when measuring the level of zinc and iron.

The data indicate the necessary correction of changes in the microelene status patients with dermatological manifestations in the post -shaped period.

In our study indicators of essential trace elements, such as zinc, selenium, cobalt b nil significantly higher in patients with papulo-izicular manifestations and in patients with urticaria, unlike patients with loss hair and acroodermatitis, where there is a pronounced deficit of these microelements.

Also, M s studied the peculiarity of the content of trace elements in the body of patients in Dependencies on dermatological manifestations (Table 3.3).

But one fact remains undeniable, there is a close connection with the recovery and improvement of microelements metabolism.

The presence in the body of minerals within normal limits is a prerequisite for the health of the human body, since trace elements participate more than 70,000 biochemical processes of the living organism.

Depending on the person, the need for minerals and vitamins changes. Iron deficiency is characteristic of women who lose iron along with menstruation. An elderly person needs calcium in large quantities, for normal bone mineralization.

Microelements have a close connection with the processes of immunogenesis, immunopathological processes and programmed cell death. Given this fact, and that that the ME regulates the synthesis of more than 50,000 enzymes and proteins, participate in the metabolism of more than 70,000 biochemical processes, theoretically a violation of trace elements can cause the severity of various pathology, including viral infection. Features of the content of trace elements in the body of patients, depending on dermatological manifestations, are presented in table 3.3. The high content of calcium, iron, copper and chromium, caused a pronounced risk of hypercoagulation.

According to ME p e, the increase in free calcium in the body increases blood pressure and the frequency of the heart contractions, which in turn can affect the on tissue oxygenation, thereby causing an oxygen deficiency In fabrics. Mild hypokalemia usually does not appear clinically, but in a combination of relative hypercal b cemia can cause muscle weakness and, as potassium in the body decreases, hypoventilation, hypotension, and up to respiratory failure, can contribute to.

Table 3.3

Features of the content of trace elements in the body of patients, depending on dermatological manifestations

Me	Control group (n = 30)	Hair loss (n = 30)	Acrodermatitis type rashes (n = 2)	Papulo-Squamous rashes (n = 10)	Urticarial rashes (n = 5)	Papulo-Vesicular rashes (n = 9)	Bubble rashes like herpes (n = 5)
Calcium, mcg	1720.0 ± 25.3	1950 ± 18.3 ***	1900.0 ± 21.3 ***	2005 ± 24.4 ***	2070 ± 19.7 ***	1970 ± 20.9 ***	1950 ± 23.4 ***
Potassium, mcg	1250.0 ± 19.1	1230 ± 16.1	1150 ± 18.5 ***	1010 ± 14.0 ***	1150 ± 15.0 ***	1250 ± 10.0 ***	1250 ± 12.0 ***
Sodium, mcg	632.0 ± 12.1	820 ± 15.0 ***	750.0 ± 20.0 ***	700 ± 14.0 ***	810 ± 25.3 ***	720 ± 14.5 ***	790.0 ± 11.0 ***
Chlorine, mcg	1530.0 ± 16.0	1990 ± 18.0 ***	2100 ± 20.0 ***	1920 ± 11.0 ***	1980.0 ± 15.1 ***	2000 ± 25.5 ***	2050 ± 12.0 ***
Iron, mcg	36.2 ± 2.3	19.0 ± 5.8 ***	20.0 ± 2.5 ***	19 ± 2.6 ***	21.0 ± 4.1 ***	23.0 ± 3.5 ***	17.0 ± 1.5 ***
Zinc, mcg	187.0 ± 8.3	120 ± 36 ***	115 ± 17 ***	123 ± 15 ***	105 ± 9 ***	107 ± 9 ***	11.07 ± 1.3 ***
Copper, mcg	29.0 ± 1.1	20 ± 5.4	18.8 ± 4.5 *	19.1 ± 1.8 ***	20 ± 3.7*	17 ± 3.5 ***	20.0 ± 4.5
Manganese, mcg	0.35 ± 0.05	0.46 ± 0.24	0.44 ± 0.14	0.36 ± 0.6	0.38 ± 0.27	0.39 ± 0.17	0.39 ± 0.17
Cobalt, mcg	0.09 ± 0.01	0.072 ± 0.022	0.080 ± 0.02	0.081 ± 0.3	0.077 ± 0.050	0.079 ± 0.04	0.082 ± 0.012
Chrome, mcg	0.7 ± 0.03	0.41 ± 0.19	0.30 ± 0.11 ***	0.41 ± 0.31	0.28 ± 0.07 ***	0.31 ± 0.17 **	0.25 ± 0.13 ***
Selenium, MKG	0.6 ± 0.04	0.37 ± 0.15	0.25 ± 0.18	0.23 ± 0.07*	0.28 ± 0.02	0.30 ± 0.07	0.23 ± 0.16 *
Iodine, mcg	1.7 ± 0.08	1.2 ± 0.6	1.1 ± 0.8	1.1 ± 0.4	1.3 ± 0.1	1.2 ± 0.4	1.1 ± 0.2

Brom, mcg	2.9 ± 0.6	3.6 ± 1.6	3.6 ± 0.7	3.7 ± 0.9	3.7 ± 1.8	3.3 ± 0.3	3.2 ± 0.2

Note:* - the differences regarding the data of the control group are significant (* - p <0.05, ** - p <0.01, *** - p <0.001)

Table 3.4

The average content of trace elements in the hair of patients depending on the floor

Me	Control group (n = 30)	Men (n = 87)	Women (n = 51)
Calcium, mcg	1720.0 ± 25.3	2420.0 ± 16.0 ***	1550.0 ± 22.0 ***
Potassium, mcg	1250.0 ± 19.1	1150 ± 23.4 ***	1300.0 ± 20.0
Sodium, mcg	632.0 ± 12.1	760.0 ± 8.9 ***	710.0 ± 12.0 ***
Chlorine, mcg	1530.0 ± 16.0	2100.0 ± 15.7 ***	2080.0 ± 18.9 ***
Iron, mcg	36.2 ± 2.3	20.1 ± 2.1 ***	17.0 ± 2.5 ***
Zinc, mcg	187.0 ± 8.3	105.0 ± 11.7 ***	140.0 ± 25
Copper, mcg	29.0 ± 1.1	21.0 ± 2.1 ***	16.0 ± 3.8 ***
Manganese, mcg	0.35 ± 0.05	0.42 ± 0.14	0.39 ± 0.3
Cobalt, mcg	0.09 ± 0.01	0.083 ± 0.015 ***	0.075 ± 0.03 ***
Chrome, mcg	0.7 ± 0.03	0.32 ± 0.11 ***	0.21 ± 0.11*
Selenium, MKG	0.6 ± 0.04	0.27 ± 0.08 ***	0.29 ± 0.15*
Iodine, mcg	1.7 ± 0.08	1.0 ± 0.05 ***	0.8 ± 0.09 ***
Brom, mcg	2.9 ± 0.6	1.6 ± 0.3	3.7 ± 0.5

Note:* - the differences regarding the data of the control group are significant (* - p <0.05, ** - p <0.01, *** - p <0.001);

We conducted an analysis to clarify the possible relationship of the content of trace elements in the body from the floor of patients (Table 3.4).

Of particular interest is a decrease in iron content in men by 44.4%, and in women by 46.9% in relation to the control group.

Iron is involved in redox processes, growth and aging of tissues, immunity mechanisms, hematopoiesis, oxygen transportation, and the normal functioning of many enzymes. Thus, even relative iron deficiency, in combination with other mechanisms, can lead to oxygen starvation.

We give a clinical example

Patient M.B. 31 years a/k 4142 received 09/13/20. With complaints about the appearance of rashes on a healthy skin after a coronavirus infection.

The patient had small rashes on the skin of the face. It was examined by a local therapist, who assessed the condition as an allergic reaction to treatment and prescribed antihistamines and anti -inflammatory drugs at home. Against the background of treatment, the condition began to deteriorate, the intensity of the rash increased. The district therapist recommended contacting the Samarkand regional skin and venereological dispensary. During the examination, an extensive damage to the skin of the face and neck with small rashes against the background of the skin erythema was noted.

The patient was on outpatient treatment. A clinical and biochemical study was conducted: it was noted NV-86 g/l, er. - 3.7 x 10^{12}., Thrombus. - 41.2 x 10^{6}. Leukocytes - 17.0 x 10^{9}., Stick -core neutrophils - 1%, segmented neutrophils -32%, eosinophils - 0%, basophili - 0%, lymphocytes - 13%, mononocytes - 1%, ESR - 18 mm/h.

OAM - without features. Biochemical blood test - without pathology. Coagulogram: Protrombin index –112% (norm 90-105%), plasma fibrinogen 5.1 g/l (norm 2.0-4.0 g/l), fibrinolytic activity 218 min. (norm 140-240 min.).

Hair analysis for the content of trace elements: ME-high content of bromine-3.6 μg (Norma-2,9 μg), chlorine-1890 μg. (norm-1530 μg), moderate reduction in iron-19 μg. (norm-36.2 μg.) and copper- 22.0 μg. (norm- 29.0 mcg.). A pronounced zinc deficiency - 97 μg. (norm- 187 μg.). The remaining indicators within the lower boundaries of the norm.

Diagnosis: allergenic dermatitis (post -shoe). SOP.: Moderate anemia;

The patient was treated: Levamisol-150 mg. 1 tablets 1 time per day, within 3 days with a break of 2 weeks (course 2 times); Immunocync- 25 mg. 1 tablets 1 time per day, since the patient had a pronounced deficit of the zinc microelement: zn - 97 μg. (Norma 187 μg.); Complete 1 tablets 1 time per day, within 4 weeks; Local therapy with Diprosalik ointment, antihistamines (suprastin) -5 mg, 1 tablet 1 time per day, in the evening, within 10 days.

The patient had the disappearance of dermatological rashes, for 6 days.

§3.3. Features of the immunological status in patients with dermatological manifestations after a coronaviral infection (Covid-19)

It was important to study the state of immunity in patients who suffered coronavirus infection. To solve this problem, we studied the state of humoral immunity, the body's immunoreactivity in patients after the coronaviral infection.

The only question that we would like to find out whether the place has a probable influence of immunological changes on the features of the course of dermatological manifestations after the coronaviral infection.

We analyzed immunoglobulins, which are of important practical importance in the diagnosis, treatment and determination of the forecast of dermatological manifestations after a coronaviral infection. As you know, immunoglobulins are produced in response to foreign agents in the body, such as various antigens - bacteria, viruses, mushrooms, parasites or various organic substances. We conducted a study of the main immunoglobulins IgG, Iga, IGM.

When evaluating changes in the humoral immunity link in patients with coronavirus infection, a significant increase in B-lymphocytes was revealed compared to control values by 1.3 times in patients in the comparison group and 1.5 times in the main group. A similar picture was observed in percentage terms in both groups.

Table 3.5

Changes in the humoral immunity in the examined patients who have undergone coronavirus infection

Indicators	Control group (n = 30)	Reference group (n = 47)	The main group (n = 61)
B-lymphocytes, %	13.2 ± 0.42	17.3 ± 0.17 ***	19.9 ± 0.19 *** ^^^
B-lymphocytes · 109/l	0.45 ± 0.07	0.86 ± 0.09 ***	0.64 ± 0.013 **^
Iga (g/l)	2.93 ± 0.09	5.89 ± 0.07 ***	8.58 ± 0.10 *** ^^^
IgM (g/l)	1.66 ± 0.08	1.96 ± 0.09*	3.86 ± 0.0 *** ^^^

Igg (g/l)	15.98 ± 0.51	19.47 ± 0.36 ***	21.87 ± 0.84 *** ^^
CEC, delicious	50.0 ± 2.5	127.6 ± 2.3 ***	176.5 ± 3.9 *** ^^^

Note:* - the differences regarding the data of the control group are significant (* - p <0.05, *** - p <0.001), ^ - the differences regarding the data of the comparison group are significant (^ - p <0.05, ^^ - p <0.01, ^^^ - p <0.001)

One of the most significant characteristics of the B-system of immunity is the concentration of serum immunoglobulins.

We found that after the coronaviral infection in the blood, the content of immunoglobulin A was increased (exceeds normal indicators by 2.0-2.9 times), which prevails in the immune complexes (Table 3.5).

The determination of the content of circulating immune complexes in the plasma confirms the connection of the disease with this basic mechanism. With dermatological manifestations, the level of these complexes in plasma is usually increased, in patients of the comparison group 127.6 conc. units, which is 2.5 times higher than the control group, in patients of the main group by 3.5 times, although there is no correspondence between the degree of this increase and the severity of the disease.

The reason for the formation of immune complexes may be infection, taking drugs, a change in protein plasma composition. Structural changes in the vascular wall and violation of collagen synthesis lead to the contact stimulation of platelets and provoke microtrombilization. The localization and severity of clinical manifestations is determined by the zone and massiveness of the lesion of the vessels.

Immunoglobulin IG G is the main factor in secondary immunity and the only type of antibodies involved in the neutralization of toxins. Patients with dermatological manifestations after a coronavirus infection came to us on average 12 weeks after a coronaviral infection. Despite this, IG G was higher from the upper boundary of the norm by 50%, which indicates the ongoing phenomena of intoxication in these patients.

IG A provides local antimicrobial protection in various areas of the mucosa. The IG A indicator in patients with a dermatological manifestation after a coronaviral infection (covid -19) was increased.

IG M (macroglobulin) - produced by activated in cells during the primary immune response to incoming antigens (viruses, bacteria, fungi, etc.). The accumulation of IG M in the body is a sign of recently suffered infection or immunization. In our patients, on average 12 weeks after the onset of the disease, the IG M indicator increased by 2 times.

We also studied the immunoreactivity of the body of patients with dermatological manifestations after a coronaviral infection (Table 3.6).

To do this, we studied indicators such as: T-lymphocytes; B-lymphocytes; C d 4+ (t-x); C d 8+ (t-s); CD16; CD38; CD95; CD25. In our observation in the main group, the amount of T-lymphocytes was an average of 27.4%, which was 20.8% lower than normal, and indicated in the oppression of T-lymphocytes under the influence of coronavirus infection.

Table 3.6

Indicators of the body's immunoreactivity in patients with dermatological manifestations after a coronavirus infection

Immunological Parameters	Cg (n = 30)	Reference group (n = 47)	The main group (n = 61)
T-lymphocytes, %	34.6 ± 1.9	31.4 ± 0.34	27.4 ± 0.19 ***
B-lymphocytes · 109/l	16.3 ± 1.1	19.6 ± 0.15 **	22.7 ± 0.15 ***
CD4+ (T-X) %	56.0 ± 1.2	31.3 ± 0.34 ***	25.04 ± 0.2 ***
CD8+ (T-C) %	15.6 ± 0.09	8.0 ± 0.08 ***	6.1 ± 0.09 ***
CD16 %	18,2±0,8	17.5 ± 0.18	18.6 ± 0.13
CD38 %	22.0 ± 0.9	20.5 ± 0.12	21.8 ± 0.2
CD95 %	20.6 ± 0.5	19.7 ± 0.1	18.9 ± 0.18 ***
CD25 %	22.4 ± 1.2	19.8 ± 0.18*	18.6 ± 0.14 ***

Note:* - the differences regarding the data of the control group are significant (* - p <0.05, ** - p <0.01, *** - p <0.001);

On the contrary, the number of v-lymphocytes increased by 39.3% of the upper boundary of the norm, which indicated the stressful nature of this infection and caused by with their disease. We cannot answer the question whether these changes are characteristic only for patients with dermatological manifestations after coronavirus infection or are a general reaction to this virus. The comparison group also noted the suppression of T-cellular immunity and the content of T-lymphocytes amounted to 31.4 ± 1.5%. The content of B - limphocytes in this group was 19.6 ± 0.5%, which was slightly higher than the upper boundary of the norm.

Inhibition of T-cell immunity in patients of both groups mainly occurs due to the suppression of T-Helper CD4+ to 35% of the lower boundary of the norm. The main function of T-Helper is the activation of an adaptive immune response to an infectious agent. T-killers, B-lymphocytes, monocytes, NK cells are activated, contributes to the release of cytokines. 22 T-Helper subtype participate in an immune response with inflammatory skin diseases. At the same time, the indicators of T - Supressors CD8+ remained within normal. Given that the main function of T - spressors is to suppress autoimmune reactions, we can assume that the skin manifestations of coronaviral infection are not an autoimmune reaction of the body in response to a viral invasion and inflammation.

The main function of the ECC (natural killer cells) - CD_{16} is the destruction (murder) of foreign agents that penetrated the body. The number of these cells indirectly indicates the possible number of antigens (viruses, bacteria, fungi, tumor cells, etc.). In patients with dermatological manifestations after a coronaviral infection, this indicator was higher by 3.6% of the upper boundary of the norm. In the group of comparison of the change in this indicator, it was within normal limits.

CD_{38} is a compliment receptor. Upon entering the body, the complement is activated, through the cascade of biochemical changes forms a proteolytic enzyme that is involved in the destruction of pathogens. In the absence of pathogens, the complement is at rest, i.e. The complement system is activated and becomes functionally active on the surface of the cells of pathogens or foreign bodies. In patients under our observation, this indicator corresponded to the physiological

norm, which indicates the absence of secondary bacterial infection of patients with dermatological changes.

CD_{95} is a trigger of programmed cell death. In our patients, this indicator was lower than the norm. With the passivity of apoptosis (programmed cell death), the cells damaged by the pathological process are preserved and remain capable of cloning. It can be assumed that under the influence of a viral infection, damage to the skin cells occurs. Damaged cells do not die, and under the influence of unknown causes they progress and form the accumulation of pathological epithelium, thereby forming dermatological manifestations.

CD_{25} is part of Tsitokina Interleukin -2 (il -2). il - 2 jointly CD_4 + leads to activation and differentiation of a clone of cytotoxic lymphocytes that attack the antigen cell.

The main function of cytokines is the regulation of intercellular and intersystem interactions. Cytokines in the body determine life expectancy and stimulation or suppression of cell growth. The cytokines also determine differentiation, functional activity and apoptosis , ensure the coherence of the work of the immune, endocrine and nervous systems in a healthy state and the state of pathology.

In all patients, after a coronavirus infection, an increase in the content of cytokines in the body is noted. As you can see from the indicators of cytokines in the table data in patients with dermatological manifestations after a coronaviral infection, from the normally higher than the norm, and from patients without dermatological changes.

With this reaction, the level of cytokines in the body increases sharply, as a result of which the immune system begins to attack the cells and tissues of its own body. This leads to the destruction of normal tissues and organs, which can be the cause of the death of the body (Table 3.7).

Each cytokine has its own functional properties.

il -1 is the main pro -inflammatory cytokine. il -1 causes an indgetation cell induction. He is a mediator of the immune response to foreign substances, including viruses.

Being a trigger of the acute phase, determines prodromal reactions, causes drowsiness, stimulates stress reactions. In our patients il -1 by 10% was higher than the upper boundary of the norm, which determined the lethargy and anxiety encountered in most patients.

Table 3.7

Analysis of cytokines in the body of patients with dermatological manifestations after coronavirus infection and

Immunological Parameters	Control group (n = 30)	Comparison group (n = 47)	The main group (n = 61)
IL-1	1.61 ± 0.05	1.68 ± 0.01	1.8 ± 0.04
IL - 2	9.13 ± 0.67	9.4 ± 0.11	9.5 ± 0.09
IL - 6	0.94 ± 0.13	1.0 ± 0.02	0.97 ± 0.023
TNF-α	5.30 ± 1.29	5.28 ± 0.23	5.6 ± 0.16

Note:* - the differences regarding the data of the control group are significant (* - p <0.05, ** - p <0.01, *** - p <0.001);

IL -2 as it was said, above, the CD_4 + leads to activation and differentiation of a clone of cytotoxic lymphocytes, attacking the antigen cell. An increase in this cytokine by 34.7% of the upper boundary of the norm indicated the ongoing inflammatory reaction of the body to the introduced infection.

IL -6 provides differentiation of B -cells and induces the response in the acute phase of an infectious disease. It has a pro -inflammatory effect and is an endogenous pyrogen and is responsible for antibodies. In patients with dermatological manifestations after coronavirus infection, this cytokine was 10.3% higher from the highest boundary of the norm, which determined the temperature reaction and other general reactions of the body of patients.

TNF - α (tumor necrosis factor) - this cytokine is responsible for many reactions of the body infected with the patient's viral infection, including: stimulates the cytotoxicity, endogenous oxidizing agents,

The induction of apoptosis, cachexia, collagenase, pro -caring, the activation factor of platelets, fibrinogenesis, etc. The indicator of this factor in patients with coronavirus infection was 1.4% higher than the upper limit of the norm.

To establish a correlation between the indicators of the essential ME and the main indicators of humoral immunity, we IGA , Igm , igg used a steam correlation analysis of the Slender.

The study of their results showed that between the indicators of the essential ME and the main indicators of humoral immunity in most cases there is a reliable positive average connection, which ranges from 0.59 to 0.15, for example, between iga and indicators Fe There is a direct reliable correlation connection (+ R = 0.49), and in the case between igg and zn direct reliable positive correlation -(R =+0.39), as well as between cr and iga the connection is practically absent (Table 3.8).

Table 3.8

The correlation coefficients between the essential ME indicators and the main indicators of humoral immunity

Indicators	Fe	I	Cu	Zn	Co	Cr	Se	Mo	Mn
IgA	0,49	0,30	0.42*	0.41*	0.44*	0,15	0,22	0.49*	0,15
IgM	0.45*	0.40*	0,19	0.52*	0.53*	0,16	0.39*	0.38*	0,33
IgG	0.59*	0,28	0.39*	0.39*	0.33*	0,17	0.31*	0.39*	0,20

Note: * - Reliability of reverse and direct communication

Resume.

Thus, we revealed the features of dermatological manifestations after a coronavirus infection such as hair loss, rashes of acroodermatitis, papulo-vomiting, papula-vesicular rashes, urticar rashes and bubble rashes according to the type of herpes.

In clinical the course of dermatological manifestations after the coronaviral infection we observed the following features.

In the post -shaped period, the appearance of bubble elements was noted according to the type of herpes, which are mainly characterized by an atypical arrangement in the lips, sometimes double -sided, lack of a tendency to relapse and painless.

In 47 (43.5%) before infection with coronaviral infection, dermatological pathology was not found. The reason for the occurrence of dermatological changes, these patients had a decrease in immunological and microelene statuses.

As noted earlier, out of 108 (100.0%) patients who underwent coronavirus infection in 47 (43.5%) dermatological manifestations were not found, and in 61 (56.5%) dermatological manifestations of various forms were found.

Next, we want to share our experience in the diagnosis, treatment and observation of patients with dermatological manifestations after a coronavirus infection covid -19 (sars - cov -2).

The most frequent dermatological manifestation after a coronavirus infection was hair loss.

Hair loss was found in 30 (49.2%) cases. It arose on average after seven to eight weeks, and sometimes 12 weeks after recovery.

Analyzing, distribution on a sexual basis should be noted that more often hair loss was found in 22 (20.4%) women since they are more are attentive to their appearance and pay attention to hair loss compared to men 12 (11, 1%).

In the prevailing majority of cases, nesting alopecia was observed 15 (13.9%)), which followed the diffuse 15 (13.9%). In addition, there were differences in the degree and localization depending on the floor.

So women observed the foci of baldness in the occipital and temporal region, while in men of the parietal and temporal areas.

In 2 (1.9%) cases, rashes were revealed by the type of acrodermatitis of the fingers and legs. In this category of patients, the appearance of red purple spots on the fingers was observed, against the background of pallor of the skin of the hands.

Rashes of the type of acroodermatitis - characterized by the appearance of the papules of yellowish, purple -red, bright pink on the surface of the skin of the palms or feet. In some cases, diffuse leather erythema, painful hyperemic foci on the skin of the feet and hands appeared to add to the papules. Over time, the papules transformed into hemorrhagic bubbles, which, referring, formed a crust of black or dark brown.

Under our observation were 8 (13.1%) patients with papulo-scubal rashes. A characteristic feature of these rashes was the absence of maternal plaques, rapid progression, and a predominant damage to the skin of the body. In clinical and biochemical analyzes, anemia, leukopenia, thrombocytosis, a change in liver indicators of blood, a tendency to hypercoagulation were noted. Low indicators of trace elements such as copper, selenium and zinc.

Urticar rashes - were characterized by the appearance of generalized foci, urticar elements of pink, dense consistency, edematous, surrounded by white or red rim. Elements of various sizes, sometimes merged, forming large round or polycyclic forms. Urticar elements had a tendency to constantly change the brightness of color and size, as well as localization. Itching was worried.

Under our observation were 5 (11.5%) patients after a coronavirus infection, the dermatological manifestations of which were in the form of urticar rashes. In these patients, the only manifestation after the coronaviral infection was rashes in the form of urticaria. A characteristic feature of urticar rashes was the beginning of rapid progression, the predominant damage to the aral surfaces of the body. In clinical-biochemical analyzes, anemia, lymphocytosis, an increase in ESR, a high content of bromine, chlorine, selenium, a moderate decrease in iron and magnesium during a spectrometric hair analysis were noted.

Papula-vesicular rashes were found in 9 patients (14.8%). The clinical feature of this type of rashes after a coronaviral infection was the vastness of the lesion, more often against the background of sweating and anemia, lymphocytosis, leukopenia, an increase in urea, creatinine and general nitrogen of blood were noted.

In addition, a high content of calcium, chlorine, chromium, a moderate decrease in zinc, selenium, copper, iron and magnesium were noted.

Bubble rashes according to the type of herpes were found in 4 patients (6.6%) and were characterized by the appearance of small bubbles, against the background of edematous and hyperemic skin, which preceded Itching and burning of the skin. The contents of the bubbles were more often serous, and later - the hemorrhagic contents of the vesicles were noted. Bubble rashes like herpes were more often observed around the lips and, in 1 case, like an encircling losing in the lower ribs. Often the bubbles spontaneously opened, forming erosion covered with hemorrhagic crust. Dermatological manifestations after a coronaviral infection had a different duration. The longest dermatological changes were observed with hair loss. In some cases (in 1 patient) when rashes, the type of acrodermatitis continued after a clinical recovery of up to two months. The remaining forms of rashes, against the background of the therapy developed, took place within two weeks.

The material for the spectrometric study was carried out with the consent of patients in the process of examination and hospitalization (or the beginning of outpatient treatment), hair from the occipital area of the head.

All patients were determined by ME before and 2 weeks after the clinical recovery. A decrease in the number of such immunomodulating essential ME as zinc, selenium, iron and an increase of such toxic elements as chlorine, bromine, in the body of patients after postponed sars - cov -2.

The best indicators for all presented trace elements were found in those patients in whom dermatological manifestations were not observed after a coronaviral infection.

Improving the metabolism of microelements in patients with dermatological manifestations after a coronavirus infection, is explained by the complite drug carried out by therapy. The appointments of zinc drugs make up for the existing deficiency of this element.

The content of micro- and macroelements in the body of men on average exceeded the content of these elements than in women. High calcium, chlorine, low

zinc and selenium, was associated with a relatively severe course of coronavirus infection in men. The high content of calcium, iron, copper and chromium, had a reliable relationship, with a pronounced risk of hypercoagulation.

Despite a certain deficiency of some trace elements, in those patients who did not observe dermatological manifestations after a coronavirus infection, reference indicators remained within normal limits. The data indicate a close connection between the imbalance of trace elements and dermatological manifestations ($p < 0.05$).

Thus, a study conducted to identify the possible connection of dermatological manifestations after a coronaviral infection with an imbalance in the body of microelements, did not reveal the connection between two indicators.

To clarify the question of whether immunological changes affect the peculiarity of the course of dermatological manifestations after the coronaviral infection, we studied the state of humoral immunity, the state of immunoreactivity and the state of the cytokine activity of the body of patients.

We conducted a study of serum concentrations of the main immunoglobulins IgG, Iga, IgM, since one of the main indicators of the insufficiency of humoral immunity is a decrease in the level of serum immunoglobulins.

According to the majority of studies [grifoni a ., li t .], In patients, the T-cells are suppressed after the coronaviral infection and the B-cell immunity is activated. When assessing changes in the humoral immunity in patients who have undergone coronavirus infection, a significant increase in B-lymphocytes was revealed compared to control values by 1.3 times in patients in the comparison group and 1.5 times in the main group. A similar picture was observed in percentage terms in both groups.

One of the most significant characteristics of the B-system of immunity is the concentration of serum immunoglobulins.

We found that after the coronavirus infection in the blood, the content of immunoglobulin A was increased (exceeds normal indicators by 2.0-2.9 times), which prevails in the immune complexes.

In our observation, the amount of T-lymphocytes was an average of 27.4%, which was 22.2% lower than normal, and indicated the depression of T-lymphocytes under the influence of coronaviral infection. On the contrary, the number of B-lymphocytes increased by 15% of the upper boundary of the norm, which indicated the stressful nature of this infection and caused dermatological manifestations.

According to our data, cytokines in patients with dermatological manifestations after coronavirus were slightly increased s il -1 by 12.4%, il -2 by 4.3%, il -6 by 3.1% and tnf - α , which was 5.6% higher than the upper boundary of the norm.

Chapter IV . Correcting therapy of patients in the post-shaped period with dermatological manifestations after a coronavirus infection (Covid-19)

§4.1. Treatment of patients with dermatological manifestations after a coronavirus infection (Covid - 19)

As the was presented earlier, the main group was 108 patients who had dermatological manifestations and 30 patients, without dermatological manifestations after a coronaviral infection (with ovid -19), compiled a comparison group.

As a result of our studies, we developed recommendations in accordance with changes in microelene status and immunological changes in patients with dermatological manifestations after a coronaviral infection (covid -19) (Table 4.1). However, to assess the effectiveness of the therapy for patients with dermatological manifestations, we decided to divide this group of patients into 2 subgroups, which included patients with dermatological diseases who received standard therapy and patients with dermatological diseases who, against the background of standard therapy, received the treatment regimen for the treatment. (complivitis, immunocink and levamisole) (tab. 4.2).

Groups of patients with dermatological diseases were distributed equivalent to pathologies and laboratory changes (ME, immunological indicators).

The first group (comparison) was 24 (39.3%) of a patient with dermatological diseases received standard therapy.

Table 4.1

Recommendations for the developed therapy of dermatological manifestations after the posted covid- 19

The purpose of therapy	Drugs		Dosage

Correction of microelements deficiency	Polyvitamins and minerals	"Complivit"	The drug is 1 tablet 2 times a day, for 4 weeks.
In the case of a pronounced lack of zinc	Zinc drugs	"Immunocink"	25 mg 2 times a day, for 4 weeks
To stimulate cellular immunity	Immunomodulator	"Levamisol"	150 mg 1 time for day, within 3 days

Table 4.2

Treatment of dermatological manifestations after posted covid - 19 infections

1. Hair loss 2. Angiaths, acrodermatitis 3.Psoriasis, KPL, pink lichei of the GIBER 4. Urticaria 5. Allergodermatitis, ekzema 6. Simple vesicular lichen	Diagnostics and treatment standards for dermatovenerology and medical cosmetology dated 10.28.2019 No. 266 (basic therapy)	1. Correction of the deficiency of ME: “Komplivit” 1 tablet 2 times a day, within 4 weeks.
		2. In the case of a pronounced lack of zinc: “Immunocink” (25 mg.) 1 tablet 2 times a day, within 4 weeks (was prescribed only to those who had a pronounced zinc deficiency).
		To stimulate cellular immunity (immunomodulator) “levamizol” (150 mg) 1 tablets once a day, within 3 days.

The second group (basic) was 37 (60.7%) of patients with dermatological manifestations, which, against the background of standard therapy, received (complovit, immunocinking and levamisole).

The proposed therapy was started from the moment the diagnosis and the beginning of the main therapy was established according to the established dermatological diagnosis, which included therapy according to the treatment and diagnosis of dermatovenerology and medical cosmetology dated October 28, 2019, the order number 266. For standard therapy as preparations of developed therapy, it was used - it was used - The vitamin-mineral complex ("complivit" tablets) after a spectrometric study of the hair, where changes were found in the microelene status, and in the case of a pronounced zinc deficiency, the drug "Immunocynka" was used. When conducting immunological studies, after detecting changes in the immunological status, the drug Levamisol (Decaris) 150 mg 1 time per day within 3 days was used to stimulate cellular immunity.

Table 4.3

The results of the treatment of patients with dermatological manifestations after the posted covid-19 depending on the treatment

Me	Control group (n = 30)	Reference group 2 (n = 24)	The main group (n = 37)
Calcium, mcg	1720.0 ± 25.3	2150 ± 21.25 ***	1381 ± 24.91 ***
Potassium, mcg	1250.0 ± 19.1	1250 ± 9.4	1189 ± 12.63
Sodium, mcg	632.0 ± 12.1	718.3 ± 10.4 ***	512.4 ± 11.9 ***
Chlorine, mcg	1530.0 ± 16.0	2021 ± 12.7 ***	1790 ± 15.3 ***
Iron, mcg	36.2 ± 2.3	21.6 ± 0.71 ***	32.0 ± 0.4 ** ^^
Zinc, mcg	187.0 ± 8.3	174.2 ± 6.2 **	186.2 ± 5.6 ^
Copper, mcg	29.0 ± 1.1	20.1 ± 1.2 ***	28.7 ± 0.91 ^^^
Manganese, mcg	0.35 ± 0.05	0.74 ± 0.1 ***	0.5 ± 0.06 ** ^^
Cobalt, mcg	0.09 ± 0.01	0.072 ± 0.04	0.083 ± 0.01
Chrome, mcg	0.7 ± 0.03	0.4 ± 0.02 ***	0.7 ± 0.05 ^^
Selenium, MKG	0.6 ± 0.04	0.32 ± 0.02 ***	0.57 ± 0.02 ^^^

Iodine, mcg	1.7 ± 0.08	0.97 ± 0.04 ***	1.61 ± 0.06 ^^^
Brom, mcg	2.9 ± 0.6	3.5 ± 0.18	3.1 ± 0.17 ^^

Note:* - the differences regarding the data of the control group are significant (* - p <0.05, ** - p <0.01, *** - p <0.001);
^ - the differences regarding the data of the comparison group are significant (^ - p <0.05, ^^ - p <0.01, ^^^ - p <0.001);

The results of these microelene status in patients after treatment are given in table 4.3. Carrying out treatment according to this scheme gave better results in comparison with the treatment of patients who did not receive developed therapy. So, according to our data, there was a positive dynamics in the restoration of trace elements such as zinc 186.2 ± 5.6, copper 28.7 ± 0.91, chrome 0.7 ± 0.05, selenium 0.57 ± 0.02 and selenium and selenium and selenium iodine, the values of which did not significantly differ from the level of control and significantly different from the same indicators of the comparison group (p <0.01, p <0.001), respectively. The data indicate an almost complete restoration of microelene status in patients who received combined therapy.

Table 4.4

The dynamics of immunological indicators, depending on the applied type of therapy in patients with dermatological manifestations after a coronaviral infection. (Covid-19) (n = 61)

Indicators	Cg (n = 30)	Comparison group 2 (n = 24)	The main group (n = 37)
T-lymphocytes, %	34.6 ± 1.92	27.4 ± 0.19 *** ^^^	36.1 ± 0.28 ^^^
B-lymphocytes · 109/l	14,6±0,15	22.7 ± 0.15 *** ^^^	18.7 ± 0.14 *** ^^^
CD4+ (T-X) %	51,9±0,52	25.04 ± 0.2 *** ^^^	53.1 ± 0.7 ^^^
CD8+ (T-C) %	12,6±0,06	6.1 ± 0.09 *** ^^^	7.8 ± 0.08 *** ^^^
CD16 %	18,2±0,8	18.6 ± 0.13	17.9 ± 0.18
CD38 %	22.0 ± 0.9	21.8 ± 0.2	22.8 ± 0.3
CD95 %	20.6 ± 0.5	18.9 ± 0.18 ***	20.1 ± 0.9
CD25 %	22.4 ± 1.2	18.6 ± 0.14 *** ^^	22.6 ± 0.9 ^^

Note:* - the differences regarding the data of the control group are significant (* - p <0.05, ** - p <0.01, *** - p <0.001); ^ - differences regarding the data before therapy (^ - p <0.05, ^^ - p <0.01, ^^^ - p <0.001);

As soon as the level of iron did not reach significantly inconsistent values regarding control, but its level was reliably different from the values in the comparison group. Consequently, patients with skin manifestations of Covid have infection, in addition to our therapy, subsequently require an additional correction of iron deficiency.

The dynamics of immunological indicators, depending on the in-mentioned type of therapy in patients with dermatological manifestations after a coronaviral infection (Covid-19), is given in table 4.4. After the treatment in patients of the main group, the normalization of the level of T-lymphocytes was observed, CD4+, CD8+, CD95 and CD25 relative to therapy (P <0.001), respectively. All indicators reached the control values of CD8+, the data after treatment significantly differed in control values (p <0.001), respectively.

Consequently, we can conclude that immunocorrective treatment made it possible to achieve the normalization of the cellular immunity, however, the low level with d_8 + may indicate the still low activation of this link, which requires further monitoring of this group of patients.

For clarity, we give clinical examples.

Clinical example No. 6

Patient K.Zh. 58 years a/K 1963 received 03/27/20. Which noted papulo-scabdress manifestations after a coronaviral infection. Dermatological manifestations began 11 weeks after the treatment of coronavirus infection, when the deterioration was noted the condition and intensity of rashes increased.

The district therapist recommended contacting the Samarkand regional skin and venereological dispensary. During the examination, redness, itching, the appearance of flat plaques and paples with clearly defined boundaries (red,) on the skin of the back (Fig . 4.1) were noted.

The patient was on outpatient treatment. A clinical and biochemical study was conducted: it was noted nv-91 g/l, er. - 3.7 x 10^{12}*., CP - 0.9, thrombus. - 40.2 x*

10^6., White blood cells. - 15.0 x 10^9., Stick -core neutrophils - 1%, segmented neutrophils -32%, eosinophils - 0%, basophiles - 0%, lymphocytes - 14%, mononocytes - 1%, ESE - 20 mm/h.

Rice. 4.1. Patient K.Zh. 58 years. a/k 1963.

Psoriasis (on the 7th day of treatment)

OAM - without features. Biochemical blood test - without pathology. Coagulogram: Protrombin index –116% (norm 90-105%), plasma tolerance to heparin 10 minutes. (norm 8-10 min), plasma fibrinogen 4.1 g/l (norm 2.0-4.0 g/l), fibrinolytic activity 215 minutes. (norm 140-240 min.).

Hair analysis for the content of trace elements: ME-high content of bromine-4.8 μg (Norma-2,9 μg), chlorine-1990 μg. (norm-1530 μg), moderate reduction in iron-21 μg. (norm-36.2 μg.) and copper- 21.0 μg. (norm- 29.0 mcg.). A pronounced zinc deficiency - 95 μg. (norm- 187 μg.). The remaining indicators within the lower boundaries of the norm.

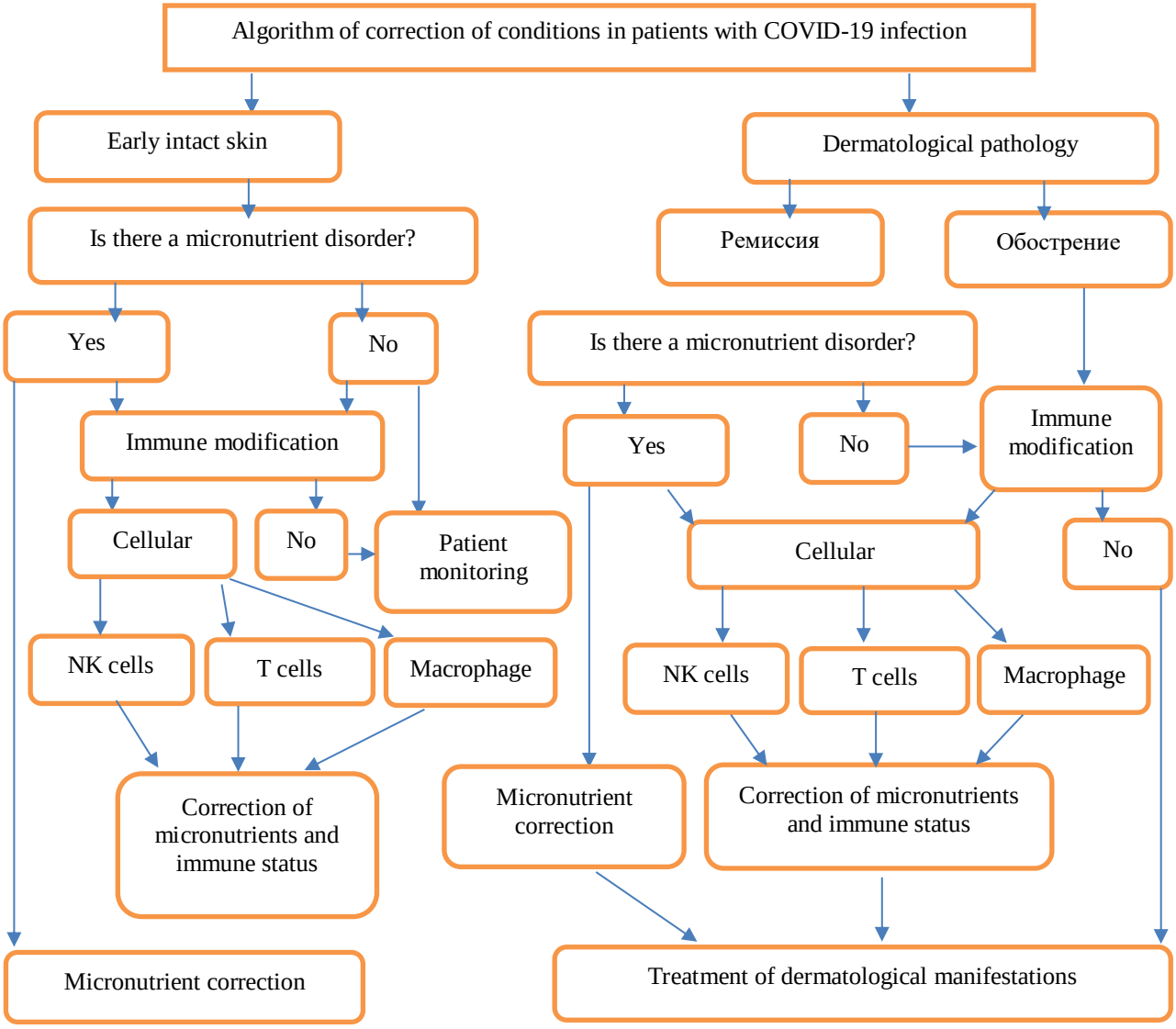
The patient was treated: Levamisol-150 mg. 1 tablets 1 time per day, within 3 days with a break of 2 weeks (course 2 times); Immunocink-25 mg. 1 tablets 1 time per day, since the patient had a pronounced deficit of the zinc microelent: zn - 95 μg. (Norma 187 μg.); Complete 1 tablets 1 time per day, within 4 weeks; Local therapy with ointment "Helstoderm B", the introduction of Klexana- 0.4 , around the

navel; Antihistamines (Loratal)- 5 mg, 1 tablet 1 time per day, in the evening, for 10 days.

The condition improved, which manifested itself by the disappearance of all dermatological manifestations.

Patients who have undergone Covid infection with early intact skin and dermatological manifestations in the remission stage need to check their microelene and immunological status. In the absence of changes in microelene and immunological status, monitoring of patients is recommended. In the presence of changes in microelements, correction is recommended by the preparation of zinc (immunocinking) with the drug recommended by us. In the presence of changes in the cellular link of immunity, patients are recommended to the drug Levamisol and finally in the presence of changes in both cases, then the use of their combination is recommended.

With exacerbation of dermatological diseases, all patients are recommended for the prescription of standard therapy, according to the standards for the diagnosis and treatment of skin diseases and, in the presence of changes in trace elements, it is recommended that the drug recruitment and immunocynka (immunocink) is recommended. In the presence of changes in the cellular link in immunity, patients are recommended to the drug Levamisol and finally in the presence of changes in both cases, the use of their combination (Fig. 4.2.) Is recommended



Rice. 4.2. The treatment algorithm for dermatological manifestations after a coronaviral infection (covid -19)

Resume. Summarizing the foregoing, we can summarize that we have developed recommendations according to changes in the microelene status and immunological changes in patients with dermatological manifestations after coronaviral infection (covid -19).

As previously stated, the main group with dermatological manifestations was 37 patients who received standard therapy in combination with Immunocyk preparations, complovit both left-handed and 24 patients, dermatological manifestations after undergoing coronaviral infection (SOVID-19), which received only standard therapy, compiled Comparison group.

As previously stated, the main group with dermatological manifestations was 37 patients who received standard therapy in combination with Immunocyk preparations, complovit both levamisole, and 24 patients, dermatological manifestations after undergoing coronaviral infection (with ovid -19), Which received only standard therapy, compiled a comparison group.

The proposed therapy was started from the moment the diagnosis and the beginning of the main therapy was established, according to the dermatological diagnosis established by the dermatological diagnosis, which included therapy according to the treatment and diagnosis of dermatovenerology and medical cosmetology from October 2019. As preparations of developed therapy, the vitamin-mineral complex ("complivit") was used, and in the case of a pronounced zinc deficiency, the drug "Immunocynka" was used. To stimulate cellular immunity, the drug Levamisol (Decaris) 150 mg 1 time per day within 3 days was used.

Carrying out treatment of combined therapy gave better results compared to patients who did not receive the therapy. There was a positive dynamics in the restoration of trace elements such as zinc, copper, chrome, selenium and iodine, the values of which did not significantly differ from the level of control and reliably differed from the same indicators of the comparison group ($p < 0.01$, $p < 0.001$), respectively. The data indicate an almost complete restoration of microelene status in patients who received combined therapy. However, the level of iron did not reach significantly incompatible values regarding control, which indicates the correction of this state with additional iron preparations.

After the treatment of the main group, the level of cellular immunity was observed in patients of the main group, except for the indicator with d_8 +, which suggests that immunocor -regional treatment made it possible to achieve normalization of the cellular immunity, but the low level with d_8 + may indicate a still low activation of this link, which requires further observation of this group of patients.

Practical Recommendations

1. Patients with dermatological manifestations after suffered coronavirus infection recommended treatment of the underlying disease according to the standards of diagnosis and treatment for dermatovenerology and medical cosmetology. However, due to the changes we discovered, all patients are recommended to conduct a study on ME and the state of cellular immunity.

2. In connection with a decrease in the indicators of the status and suppression of cellular, as well as the activation of humoral immunity in the complex of treatment of dermatological manifestations after a coronaviral infection, it is recommended to include a combination in the combination of the drugs of T-cell immunity, in the form of levamisole, 150 mg 1 time per day Within 3 days and the vitamin-mineral complex complibes 1 tablet 2 times a day for 4 weeks, as well as the drug Immunocink in a dosage of 0.25 per 1 t 2 times a day for 4 weeks.

List used literature

1. Belyakov N.A., Rassokhin V.V., Yastrebova E.B. Coronavirus infection Covid-19. The nature of the virus, pathogenesis, clinical manifestations. Message // HIV infection and immunosuppression. - 2020. - No. 12 (1). - S. 7-21.

2. Dvornikov A.A., Silin A.A., Gaidina T.A. The skin manifestations in the coronavirus disease of 2019 (covid -19) // Archive of the internal medical s. - 2020. - No. 10 (6). -S. 422-429.

3. Kostinov M.P., Markelova E.V., Svitich O.A., Polishchuk V.B. SARS-COV-2 immune mechanisms and potential drugs for the prevention and treatment of COVID-19 // Pulmonology. - 2020. -No. 30 (5). - S. 700-708.

4. Kutyrev V.V., Popova A.Yu., Smolensky V.Yu., Yezhlova E.B., Demina Yu.V., Safronov V.A., Karnaukhov I.G., Ivanova A.V., Shcherbakova with .A. Epidemiological features of a new coronavirus infection (Covid-19). Message 1: Models for the implementation of preventive and anti -epidemic measures // Problems of especially dangerous infections. - 2020. - No. 1 (4). - S. 6-13.

5. Kutyrev V.V., Popova A.Yu., Smolensky V.Yu., Yezhlova E.B., Demina Yu.V., Safronov V.A., Karnaukhov I.G., Ivanova A.V., Shcherbakova with .A. Epidemiological features of a new coronavirus infection (Covid-19). Message 2: Features of the course of the epidemic process Covid-19 in relation to the anti-epidemic measures in the world and the Russian Federation // Problems of especially dangerous infections. - 2020. - No. 2 (4). - S. 6-12.

6. Kurbanov B.Zh., Anvarova L.U. Analysis of the epidemiological situation in a new coronavirus infection (covid -19) in the Republic of Uzbekistan // News of dermatovenerology and reproductive health. - 2021.- No. 1-2 (93-94). - S. 93-94.

7. Kurbanov B.Zh., Anvarova L.U. , Tagaev Sh.B. The origin covid -19 and its course in somatic diseases // News dermatovenerology and reproductive health. - 2021.- No. 1-2 (93-94). S. 31-33.

8. Muminov D.K. Early rehabilitation of patients after the Covid-19 infections (clinics-pathogenetic and therapeutic aspects): Diss ... .. D-Ra medical nauk. - Tashkent, 2021. - 213 p.

9. Nikiforov V.V., Suranova T.G., Chernobrovkana T.Ya., Yankovskaya Y.D., Burova S.V. New coronavirus infection (Covid-19): clinical and epidemiological aspects // Archive of internal medicine. - 2020. - No. 10 (2). S. 87-93.

10. Oripov O. and . Courteous thrombosis of the cavernous sinus is connected s covid-19: features of ophthalmic signs, treatment and prevention.: Diss ... .. Kand.-Med. Nauk. - 2022. - 106 p.

11. Skalny A.V. Human microelentoses (diagnosis and treatment). - Moscow: KMK, 2011. - C . 123-124.

12. Potkaev N.N., Zhukova O.V., Protsenko D.N. et al. Clinical characteristics of dermatological manifestations with a new coronavirus infection Covid-19 caused by SARS-COV-2 // Clinical dermatology and venereology. - 2020. - No. 19 (3) .- S. 271–286.

13. Romanov B.K. Coronavirus infection Covid-2019 // Safety and risk of pharmacotherapy. - 2020. No. 8 (1)- P. 3-8.

14. Rumyantsev A.G. Coronavirus infection Covid-19. Scientific challenges and possible ways of treating and prevention of disease // Russian Journal of Children's Hematology and Oncology (Redgio). - 2020. No. 7 (3). - S. 47-53.

15. RAMKULOVA N. R. Assessment of visceral disorders and their correction after s ovid-19 infections: dissens ... ..d-ras medical nauk. - Tashkent, 2022. - 211 p.

16. Saidaliev S.S., Mirzabaev D.S., Madaminov M.M. The lessons obtained in the fight from coronavirus disease in the Republic of Uzbekistan // Problems of especially dangerous infections. - 2020. - No. 1 (2). - S. 138-140.

17. Khryanin A.A., Sturov V.G., Nadeev A.P., Bocharova V.K. Skin manifestations with a new coronavirus infection Covid-19 caused by SARS-COV-2 // Bulletin of dermatology and venereology. - 2020. - No. 96 (3). - S. 53–62.

18. Alhenc-Gelas F, Drueke BT. Blockade of Sars-Cov-2 Infection by Recombinant Soluble Ace2 // Kidney Int. - 2020. - p . 48-51.

19. American Academy of Dermatology. Guidance on the Use of Biologic Agents During Covid-19 Outbreak // Last Accessed; 8 April 2020. - p . 111-113.

20. Abdelmaksoud a, Goldust M, Vestita M. Comment on “Covid-19 and Psoriasis: is it Time to Limit Treatment with ImmunosUppressants? A Call for Action ”// Dermatol Ther. - 2020. - p . 52-56.

21. Arora G, Kassir M, Jafferany M et al. The Covid-19 Outbreak and Rheumatologic Skin Diseases // Dermatol Ther. - 2020. - p . 40.

22. Al-Bari Maa. Chlooroquine Anaalogues in Drug Discovery: New Directions of USES, Mechanisms of Actions and Toxic Manifestations Malaria to Multifarious DiseSes // J Antimicrob Chemother. - 2021. - Vol.70. - p . 1608–1621.

23. Ben Addi a, Lefort a, Hua X, Libert F, Communi D, Ledent C, et al. Modulation of Murine Dendric Cell Function by Adenine Nucleotides and Adenosine: Involvement of the A (2B) Reception // EUR J Immunol.- 2019.- 2.- p . 24-25.

24. BOST P, GILADI A, Liu Y, Bendjelal Y, Xu G, David Ea, et al. Host-Viral Infection Maps Reveal Signatures of Sever Covid-19 Patients // Cell. - 2020. - Vol. 4. - p . 156-159.

25. Blanco-Melo D, Nilsson-Payant Eb, Liu CW, UHL S, HOAGLAND D, MOLLER R, et al. Imbalance Host Response to Sars-Cov-2 Drives Development OF COVID-19 // Cell.- 2020.- p . 5-9.

26. BELZ GT, Smith0 CM, Kleinert L, Reading P, Brooks A, Shortman K, et al. Distinct Migrating and Nonmigrating Dendric Cell Populations are Involved in MHC CLASS I-RESTRICTED ANTIGEN PRESTION AFTER LUNG Infection with VITH VIRUS // PROC NATLE ACAD SCII SA. - 2021. - p.18-20.

27. Bai Y, Yao L, Wei T et al. Pressmed Asymptomatic Carrier Transmission of Covid-19 // Jama. - 2020. - No. 323. - p . 1406–1407.

28. Bashyam am, Feldman Sr. SHOULD PATIENTS STOP Their Biologic Treatment During the Covid-19 Pandemic // J Dermatolog Treat. - 2020. - No. 19. - p . 1–2.

29. Bardazzi F, Loi C, Sacchelli L, Di Altobrando A. Biologic Therapy for Psoriasis During the Covid-19 outbreak is not a choice // J Dermatolog Treat. - 2020. - p . 78-80.

30. Boelsma E, Van De Vijver LP, Goldbohm Ra, Klopping-Ketelaars IA, Hendriks HF, Roza L. Human Skin Condition and Its Associations with Nutriant Conventions in Sermum And Diet M j Clin nutr.- 2021.- Vol. 77. - p . 348–355.

31. Bouwstra Ja, Pilgram GSK, PONEX M. Structure of the Skin Barrier. In: Elias PM, Feingold Kr, Editors // Skin Barrier. Taylor & Francis; New York. - 2019. - p . 65–96.

32. Carr A.C. MicronUtript Status of Covid-19 PATIENTS: A Critical Consedation // Crit Care. - 2020. - Vol. 24. - p . 349.

33. Channappanavar R, and Perlman, S. Pathogenic Human Coronavirus Infections: Causes and Consequences of Cytokine Storm and Immunopathology // Semin Immunopathol. - 2019. p . 27-29.

34. Chandra R., sarchielli P. Nutritional Status and Immune Responses // Clin Lab Med. - 2021. - Vol. 13. - p . 455-461.

35. Collange O, Tacquard C, Delabranche X, Leonard-Lorant I, Ohana M, Onea M, et al. Coronavirus Disease 2019: Associated Multiple Organ Damage // Open Forum Infect Dis.- 2020. - P . 4.

36. Chen N, Zhou M, Dong X, QU J, Gong F, Han Y, et al. Epidemiological and Clinical Characteristics of 99 Cases of 2019 Novel Coronavirus Pneumonia in Wuhana: A Descriptive Study // Lancet.- 2020. - P . 102-105.

37. Chu H, Zhou J, Wong Bh, Li C, Chan JF, Cheng ZS, et al. Middle East Respiratory Syndrome Coronavirus Efficently Infects Human Primary T-Lymphocytes and Activates the Exteinsic and Intrinsic Pathways // J. 2020. - p . 45-51.

38. Cameron MJ, Bermejo-Martin JF, Danesh A, Muller MP, and Kelvin DJ. Human Immunopathogenesis of Severe Accate Respiratory Syndrome (SARS) // Virus Res. - 2019. - p . 189-194.

39. Chan jf, kok kh, zhu z, chu kk, yuan ts, yuen ky, et al. Genomic Characterization of the 2019 Novel Human-Pathogenic Coronavirus Isolated from a Patient with atypical Pneumonia Inter Visiting Wuhan // Emerg Microb Infect. - 2020. - p . 53-57.

40. Cron RQ, and Chatham ww. The QUESSTION OF THE REMAIN ON THE REAPY For Chronic Rheumatic Diseases in the Setting of the Covid-19 Pandemic // J Rheumatol.- 2020. - P . 66-70.

41. Casanova Jl, and Su Cha. Global Effort to Define the Human Genetics of Protective Immunity to Sars-Cov-2 Infection // Cell- 2020.- p . 26-29.

42. Chen Y, Guo Y, Pan Y, Zhao ZJ. Structure Analysis of the Reciptor Binding of 2019-NCOV // Biochem Biophys Ress Commun. - 2020. - Vol. 525. - p . 135–140.

43. CHEN Y, PRADHAN S, XUE S. What are we do not in the Dermatology Outpartment Amidst the Raging of the 2019 Novel Coronavirus? // J Am Acad Dermatol.- 2020.- Vol. 82. - p . 1034.

44. Chawla S. Covid-19: Challenges and Opportunites for Dermatology Response // J Dermatolog Treat. - 2020. - p . 35-39.

45. Conforti C, Giuffrida R, Dianzani C, Di Meo N, Zalaudek I. Covid-19 and Psoriasis: IS it Time to Limit Treatment with Immunosuppressants? A Call for Action // Dermatol Ther. - 2020. - P . 23-31.

46. Dijkman R, Jebbink Mf, Deijs M, Milewska a, Pyrc K, Buelow E, et al. Replication-Dependent Downregulation of Cellular Angiotensin- Converting Enzyme 2 Protein expression by Human Coronavirus NL63 // J Gen Virol. - 2021. - p . 115-118.

47. Dong N, Yang X, Ye L, Chen K, Chan Ew-C, Yang M, et al. Genomic and Protein Structure Modelling Analysis depicts The Origin and Infectivity of 2019-Ncov, a New Coronavirus Which Cased a Pneumonia Outbreak in Wuhan, China // BIIRXIV.- 20 20. - p . 98-100.

48. Darlenski R, Tsankov N. Covid-19 Pandemic and the Skin-What Shoup Dermatologists Know? // Clin Dermatol. - 2020. - p . 34-36.

49. DI Lernia V. Antipsoriatic Treatments During Covid-19 outbreak // Dermatol ther. - 2020. - Vol. 29. - p . 23-25.

50. Dong Y, Mo X, Hu Y, Qi X, Jiang F, Jiang Z, et al. Epidemiology of Covid-19 Among Children in China // Pediatrics. - 2020. - p . 7-8.

51. European Center for Disease Prevention and Control // European Center for Disease Prevention and Control Data Geographical Distribution of 2019- NCOV CASS. - 2019. - p . 21-24.

52. El-Hashim Az, Renno WM, Raghupathy R, Abduo Ht, Akhtar S, and Benter, if. Angiotensin-(1-7) Inhibits Allergic Inflammedion, Via The Mas1 Receptor, Through Suppression of Erk1/2- and NF-Kappab-Dependent PathWays // Br J Pharmacol.- 2021. 404.

53. Fang L, KARAKILAKIS G, and Roth M. Are Patients with Hypertension and Diabetes Mellitus At Increased Risk for Covid-19 Infection? // Lancet.- 2020. - p . 39-41.

54. Frisk-Holmberg M, Bergqvist Y, Englound U. Chlooroquine Intoxication Letter // Br J Clin Pharmacol. - 2013. - Vol. 15. - p .502–503.

55. Galván Casas C., Català A., Carretero Hernández G. et al. Classical of the Cutaneous Manifestations of Covid-19: a Rapid Prospective Nationwide Consens Study in Spain with 375 CASS // British Journal of Dermatology. - 2020. - p . 76-79.

56. Gorse GJ, Donovan MM, Patel GB, Balasubramanian S, and Lusk RH. Coronavirus and Other Respiratory Illnesses Comparing Older with Younger Adults // Am J Med. - 2021. - p . 116-120.

57. Gorse GJ, O'Connor Tz, Hall SL, Vitale Jn, and Nichol KL. Human Coronaviruses and Acute Respiratory Illnesses in Older Patients with Chronic Obstructive Pulmonary Disease // J Infect Dis.- 2019.- p . 13-19.

58. Goren A, MC Coy J, Wambier Cg et al. What sods Androgenetic alopecia have to do with covid-19? An Insight Into a Potential New Therapy // Dermatol Ther. - 2020. - p . 133-165.

59. Gheblawi M, Wang K, Viveiros a, Nguyen Q, Zhong J, Turner Ja, et al. Angiotensin-Converting Enzyme 2: Sars-Cov-2 Receptor and Regulator of the

Renin -angiotensin System. Celebrating the 20th Anniversary of the Discovery of Ace2 // Circ Res.- 2020. - p . 65-68.

60. Guan Wj, Ni Zy, Hu Y, Liang Wh, OU CQ, He JX, et al. Clinical Characteristics of Coronavirus Disease 2019 in China // N English J Med.- 2020. - P.12.

61. Gu J, Gong E, Zhang B, Zheng J, Gao Z, Zhong Y, et al. Multiple Organ Infection and the Pathogenesis of Sars // J Exp Med.- 2020. - P.28.

62. Grifoni a, Weiskopf D, Ramirez Si, Mateus J, Dan JM, Rydyznski Moderbacher, C, et al. Targets of T Cell Responses to Sars-Cov-2Coronavirus in Humans with Covid-19 Disease and UNEXPOSED Individuals // Cell. - 2020. - p . 55-59.

63. GISONDI P, Bellinato F, Conti A et al. Consensus on the place in therapy of tnf- α inhibitors in the Treatment of Patients with Chronic Plaque Psoriasis // J EUR Acad Dermatology Venereol. - 2020. - p . 65-67.

64. Glowacka I, Bertram S, Herzog P, Pfefferle S, Steffen I, Muench Mo, et al. Differential Download of Ace2 by the Spike Proteins of Severe Acute Respiratory Syndrome Coronavirus and Human Coronavirus NL63 // J Virol.- 2019. - p . 201-205.

65. Huang C, Wang Y, Li X et al. Clinical Features of Patents Infected with 2019 Novel Coronavirus in Wuhana // Lancet. - 2020. - Vol. 395. - p . 497–506.

66. Hamming I, Timens W, Bulthuis M, Lely A, Navis G, Van Goor H. Tissue First Step in Understanding Sars Pathogenesis // J Pathol. - 2021. -Vol.203. - p . 631–637.

67. Henry D, ACKERMAN M, SANCELME E, Finon A, ESTEVE E. Urticarial Erupation in Covid-19 Infection // J EUR Acad Dermatol Veneereol. - 2020. - p . 86-88.

68. Jackson DJ, Busse ww, Bacharier LB, Kattan M, O'Connor GT, Wood Ra, et al. Association of Respiratory Allergy, Asthma and Expression of the Sars-Cov-2 Receptor, Ace2 // J allergy Clin Immunol.- 2020.- P . 68-70.

69. Joob B, Wiwanitkit V. Covid-19 Can Present with a Rash and Be Mistaken for Dengue. J Am Acad Dermatol.- 2020.- P. 55-57.

70. Ki V, Rotstein C. Bacterial Skin and Soft Tissue Infections in Adults: a Review of their Epidemiology, Pathogenesis, Diagnosis, Treatment and Site of Care // Can J. J. J. J. Robiol. - 2019. - Vol. 19. - p . 173–84.

71. Kuba K, IMAI Y, RAO S, Gao H, Guo F, Guan B, et al. A Crucial Role of Angiotensin Converting Enzyme 2 (ACE2) in Sars Coronavirus -induced Lung INJURY // NAT Med.- 2021.- p . 74-76.

72. Kuo Cl, Pilling Cl, Atkins LJ, Masoli Haj, Delgado J, Kuchel AG, et al. APOE E4 Genotype Predicts Severe Covid-19 in the UK Biobank Community Cohort // J Gerontol a Biol Sci Med Sci .- 2020.- p . 61-62.

73. Khan S, Siddique R, Sereen Ma et al. The Emergence of A Novel Coronavirus (Sars-COV-2), Their Biology and Therapeutic 1 Options // J Clin Microbiol. - 2020. - p . 65-69.

74. Kwatra Sg, Sweren RJ, Grossberg Al. Dermatology Practices as Vectors for Covid-19 Transmission: A Call for ImmediaTies of Non-Emergent Dermatology Visits // J Am Acad Dermatol. - 2020. - p . 47-52.

75. Karakike E, and Giamarellos-Bourboulis Ej. Macrophage Activation-Like Syndrome: A DistINCT Entity Leading to Early Death in Sepsis // Front Immunol.- 2019. - P . 68-72.

76. Lakdawala N, Babalola O, 3rd Fedeles F, McCusker M, Rocketts J, Whitaker-Worth D, Grant-Kels JM. The Role of Nutrition in Dermatologic Diseases: Facts and Controversies // Clin Dermatol. - 2019. - Vol. 31. - p . 677–700.

77. LU R, Zhao X, Li J, Niu P, Yang B, Wu H, et al. Genomic Characterisation and Epidemiology of 2019 Novel Coronavirus: Implicates for Virus Origins and Reception Binding // Lancet.- 2020. - P.36-37.

78. Lim YX, NG YL, TAM JP, and Liu DX. Human Coronaviruses: A Review of Virus - Host Interacts // Diseases. - 2021. - p . 21-26.

79. Liu XD, Liang QJ, and Fung ST. Human Coronavirus -229E, -OC43, -NL63, and -HKU1 // Refer mod Life Sci. - 2020. - p.55-57.

80. Li W, Moore MJ, Vasilieva N, Sui J, Wong Sw, Berne Ma, et al. Angiotensin-Converting Enzyme 2 is a Functional Reception for the Sars Coronavirus // Nature. - 2020. - p . 23-26.

81. LU X, Pan J, Tao J, and Guo D. Sars-Cov NucleoCapsid Protein Antagonizes IFN-Beta Response by Targeting Initial STEP OFN-BETA Indiance PATHAY, And ITS C-Terminal ReGion CR Itical for the antagonism // Virus Genes. - 2021. - p . 268-272.

82. Liu J, Li S, Liu J, Liang B, Wang X, Wang H, et al. Longitudinal Characteristics of Lymphocyte Responses and Cytokine Profiles in the Peripheral Blood of Surs-Cov-2 Infieded Patients // Ebiomedicine.- 2020.- P . 71-72.

83. Li T, QIU Z, HAN Y, Wang Z, FAN H, LU W, et al. Rapid Loss of Both CD4+ and CD8+ T Lymphocyte Subsets During the Accate Phase of Severe Acute Respiratory Syndrome // Chinese Med J. - 2019. - P.184.

84. Li X, Chen A, and Xu A. Profile of Specific Antibodies to the Sars-Ssociated Coronavirus // N English J Med. - 2019. - p . 243.

85. Lee HK, Lee BH, Seok SH, BAEK WM, Lee YH, KIM JD, et al. Production of Specific Antibodies Against Sars-Coronavirus nucleoCapsid Protein Without Cross Reactivity with Human Coronaviruses 229e and OC43 // J VET Sci.- 2020.- R < . 34-35.

86. Lebwohl M, Rivera-Oyola, Rmurrell DF. SHOULD BIOLOGICS For PSORIASISS BE Interrupte in the Era of Covid-19? // J Am Acad Dermatol. - 2020. - Vol. 82. - p . 1217–1218.

87. Lan J, Song Z, Miao X et al. Skin Damage Among Healthcare Workers Managing Coronavirus Disease-2019 // J Am Acad Dermatol.- 2020.- Vol. 82. - p . 1215–216.

88. Lei C, Huigo L, Wei L, Liu J, Liu K, Shang J, et al. Analysis of Clinical Features of 29 Patients with 2019 Novel Coronavirus pneumonia // Chin J Tuberc Respir Dis. - 2020. - p . 34-35.

89. Mathern Dr, and Heeger PS. Molecules Great and Small: The Complement System // Clin J Am Soc Nephrol. - 2019. - p . 365-366.

90. Murakami M, Kamimura D, and Hirano T. Pleiotropy and Specificity: Insights from the Interleukin 6 Family of Cytokines // Immunity. - 2019. - p . 46-47.

91. Memar O, Tyring SK. Cutaneous Viral Infections // J Am Acad Dermatol. - 2015. - Vol. 33. - p . 279–287.

92. Mehta P, Porter CJ, Manson JJ, ISAACS DJ, Openshaw Mjp, Mcinnes Ib, et al. Therapeutic Blockade of Granulocyte Macrophage Colony-Stimulating Factor in Covid-19-Sassociated HyperinflamMation: Challenges and Opportunites // Lancet. - 2020. - P. 64-66.

93. Mehta S. Nutritional Status and Covid-19: An Opportunity for Lasting Change? // Clin med (lond). - 2020. Vol. 20. - p . 270–273.

94. Mihai C, Dobrota R, Schröder M et al. COVID-19 in A PATIENT WITH SYSTEMIC SCLEROSSIS TREATEDH TOCILIZUMAB for SSC -LD // Ann RHEUM DIS. - 2020. - Vol. 79. - p . 668–669.

95. Muscogiuri G., Barrea L., Savastano S., Colao A. Nutritional Recomendations for Covid-19 Quarantine // EUR J CLIN NUTR. - 2020. - Vol. 74. - p . 850–851.

96. Naziroglu M., Yildiz K, Tamturk B, Erturan I, Flores-ARCE M. Selenium and PSORIASISS // Biol Trace Elem Res. - 2021. - Vol. 150. - P. 3–9.

97. Niehues H, Bouwstra Ja, El Ghalbzouri A, Brandner JM, Zeeuwen Pljm, Van Den Bogaard EH. 3D Skin Models for 3r Research: The Potential of 3D Reconsted Skin Models to Study Skin Barrier Function // Exp Dermatol. - 2019. - Vol. 27. - p . 501–511.

98. Price Kn, Frew JW, Hsiao Jl, Shi Vy. COVID-19 and Immunomodulator-ImmunosUppressant Use in Dermatology // J Am Acad Dermatol. - 2020. - Vol. 82. P. 173–175.

99. Perlman S, and Netland J. Coronaviruses Post-Sars: Update on Replication and Pathogenesis // Nat Rev Microbiol.- 2019.- p . 39-50.

100. Peiris J, Lai ST, POON LLM, Guan Y, Yam Lyc, Lim W, et al. Coronavirus as a Possible Cause of Severe Acute Respiratory Syndrome // Lancet. - 2021. - P. 89-91.

101. Pistorius Ma, Blaise S, Le Hello C; French Society for Microcirculation, Barbarot S, Dréno B. Chilblans and Covid19 Infection: Causaly or Coincidence? How to Proced? // J Med VASC. - 2020. - Vol. 45 (4). - p . 221-223.

102. Qian Z, Travanty Ea, Oko L, Eden K, Berglund a, Wang J, et al. Innate Immune Response of Human Alvelar Type II Cells Infected with Severe Acute Respiratory Syndroome-Coronavirus // Am J Respir Cell Mol Biol.- 2019.- P. 231-233.

103. Radi G, Diotallevi F, Campanati A, Offidani A. Global Coronavirus Pandemic (2019-NCOV): Implication for An Italian Medium Size Dermatologic OF A II LEVEL Hospital // J EURA ACADA Matol Venereol. - 2020. - P. 71-72.

104. Richardson DP, LoveGROVE JA. Nutritional Status of Micronutrians as a Possible and ModifiaBle Risk Factor for Covid-19: a UK Perspective // Br J Nutr. - 2021. - Vol.125 (6). - P. 678-684.

105. Rudnicka L, Gupta M, Kassir M Et Al. Priorities for Global Health Community in Covid-19 Pandemic // Dermatol ther. - 2020. - p . 49-55.

106. Reinholz M, French L. Medical Education and Care in Dermatology During the Sars-Cov2 Pandemia: Challenges and Chances // J EUR Acad Dermatology Venereol. - 2020. - P. 36-37.

107. Ruan Q, Yang K, Wang W, Jiang L, Song J. Clinical Predictors of Mortaly Due to Covid-19 Based on Analysis of Data of 150 Patients from Wuhana // Intensive Care med-. 2020. P. 62-64.

108. M S. Cutaneous manifestations in covid-19: a first person // J Eur Acad Dermatology Venereol. - 2020. - P. 122-124.

109. SU C-J, Lee C-H. Viral Exanthem in Covid-19, a Clinical Enigma with Biological Significance // J EUR Acad Dermatology Venereol. - 2020. - P. 25-26.

110. Simonnet a, Chetboun M, Poissy J, Raverdy V, Noulette J, Duhamel a, et al. High Prevalence of Obesity in Severe Acute Respiratry Syndrome Coronavirus-2 (Sars-COV-2) REPURING INVASIVE MECHANICAL VENTION (Silver Spring). - 2020. - P. 68-69.

111. Shah P, Zampella jg. Use of Systemic Immunomodulating therapies During the Coronavirus Disease 2019 (Covid-19) Pandemic // J Am Acad Dermatol. - 2020. - P. 55-57.

112. Siddell S, Ziebuhr J, and Snijder Ej. Coronaviruses, toroviruses, and arteriviruses. Topley & Wilson's Microbiology and Microbial Infections // Hodder Arnold Lond. - 2019. - p.141-142.

113. SU S, Wong G, Shi W, Liu J, Lai Kca, Zhou J, et al. Epidemiology, Genetic Recombination, and Pathogenesis of Coronaviruses // Trends Microbiol. - 2021. - p . 952-954.

114. Tortorici Ma, and Veesler D. Structural Insights Into Coronavirus Entry // Adv Virus Res.- 2019.- P. 99-102.

115. Tian S, Hu W, Niu L, Liu H, Xu H, and Xiao Ys. Pulmonary Pathology of Early-Phase 2019 Novel Coronavirus (Covid-19) Pneumonia in Two Patients with Lung Cancer // J Thorac Oncol. - 2021. - P. 52-53.

116. Tikellis C, and Thomas MC. Angiotensin-Converting Enzyme 2 (ACE2) is A Key Modulator of the Renin Angiotensin System in Health and Disease // Int j pept.- 2021.- p . 77-96.

117. TAO J, Song Z, Yang L, Huang C, Feng a, Man X. Emergency Management For Preventing and Controling Nosocomial Infection 2019 Novel Coronavirus: Implications for the Dermatology ArtMent // Br J Dermatol. - 2020.- P.96-114.

118. Who. Coronavirus Disease 2019 (Covid-19) // Update Who Report 2020.-2019. p . 2-5.

119. Who. Coronavirus Disease 2019 (COVID-19) // SITUATION Report-52. Geneva: World Health Organization. - 2019. - p . 5-7.

120. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical Characteristics of 138 Hospitalized Patents with 2019 Novel Coronavirus-Infected Pneumonia in Wuhana // Jama.- 2020.- P. 78-79.

121. Wan Y, Shang J, Graham R, Baric RS, and Li F. Receptor Recognition by Novel Coronavirus from Wuhan: Analysis Based-Long Structural Studies of Sers // J Virol. - 2020. - p . 356-372.

122. Wit de, Doremalen Vn, Falzarano D, and Munster JV. Sars and Mers: Recent Insights Into Emering Coronaviruses // Nate Rev Microbiol. - 2016. - p . 236-248.

123. Weiss SR, and Navas-Martin S. Coronavirus Pathogenesis and the Emerging Pathogen Severe transpiratory Syndrome Coronavirus // Microbiol Mol Biol Rev. - 2015. - p . 65-69.

124. Wilk AJ, Rustagi A, Zhao NQ, Roque J, Martinez-Colon GJ, McCHnie Jl, et al. A Single-Cell Atlas of the Peripheral Immune Response in Patients with Sever Covid-19 // Nat Med. - 2020. - P. 112-114.

125. Wu f, zhao s, yu b et al. A New Coronavirus Associated with Human Respiratory Disease in China // Nature. - 2020. - Vol. 579. p . 265–269.

126. Wang Y, Wang Y, CHEN Y, QIN Q. Unique Epidemiological and Clinical Features of the Emering 2019 Novel Coronavirus Pneumonia (Covid-19) Impalicate SPECIAL CONTROL CONTROL MEASURAS // J MED Virol. - 2020. - Vol. 92. - p . 568–576.

127. World Health Organization. Modes of Transmission of Virus Causing Covid-19: Implications for IPC Precaution Recomminess. - 2020. - P. 14-17.

128. Wu Z, McGoogan JM. CHARACTERISTICS OF AND IMPORTANT LESSONS FROM The Coronavirus Disease 2019 (Covid-19) Outbreak in China: Summary of A Report of 72314 Cases From The Chinese Center Disease Control And Prev Ention // Jama. - 2020. - Vol. 323. - p . 1239–242.

129. Wollenberg a, Flohr C, Simon D et al. Task for atopic dermatitis (ETFAD) Statement on Severe Acute Respiratory Syndrome Coronavirus 2 (Sars-

Cov-2) -Infection and Atopic Dermatitis // J EUR Acad Dermatology Eol. - 2020.- P. 235-240.

130. Xu X, Chen P, Wang J, Feng J, Zhou H, Li X, et al. Evolution of the Novel Coronavirus from the Ongoing Wuhan Outbreak and Modeling of Its Spike Protein for Risk of Human Transmission // Life Sci. - 2020. - P. 136-140.

131. Xu Z, Shi L, Wang Y, Zhang J, Huang L, Zhang C, et al. Pathological Findings of Covid-19 Associated with Acute Respiratry Distress Syndrome // Lancet Resp Med.- 2020.- P. 154-156.

132. Yan Y, Chen H, Chen L ET Al. Consensus of Chinese Experts on Protection of Skin and Mucous Membrane Barrier for Health-Care Workers Fighting Coronavirus Disease 2019. Dermatol the 2020. p . 122-123

133. Yin Y, and Wunderink RR. Mers Sars and Other Coronaviruses as cases of pneumonia // Respirology.- 2019. - P . 103-111.

134. Yang X, Yu Y, Xu J, Shu H, Xia J, Liu H, et al. Clinical Cousse and Outcomes of Critically Ill Pathents with Sars-Cov-2 Pneumonia in Wuhana: A Single-CENTERED, RETROSPECTIVE, OBSERVATIONAL STUDY // Lancet Respir Med.- 2020 - P. 165-166.

135. Zheng J. Sars-Cov-2: An Emering Coronavirus That Causes a Global Threat // Int J Biol Sci.- 2020.- P. 40-46.

136. Zhou P, Yang XL, Wang XG, Hu B, Zhang L, Zhang W, et al. a pneumonia outbreak Associated with a New Coronavirus of Probable Bat Origin // Nature.- 2020. - p . 79-82.

137. Zhuoyue W, Xin Z, and Xinge Y. Ifa in Testing Specific Antibody of Sars Coronavirus // South China J Prev Med. - 2019.- P. 78-79.

138. Zhao, M. Cytokine Storm and Immunomodalaton Therapy in Covid-19: Role of Chloquine and Anti-6 Monoclonal Antibodies // Intimicrobe Agents. - 2020. - P. 11-23.

139. Zha L, Li S, Pan L, Tefsen B, Li Y, French N, et al. Corticosteroid Treatment of Patients with Coronavirus Disease 2019 (Covid-19) // Med J Aust.- 2020.- P. 111-112.

140. Zhou Y, Fu B, Zheng X, Wang D, Zhao C, Qi Y, et al. Pathogenic T Cells and Inflammatory Monocytes Incite Inflammatory Storm in Severe Covid-19 Patients // Natl Sci Rev. - 2020. - P. 43-44.

141. Zou X, Chen K, Zou J, Han P, Hao J, Han Z. Single-Cell Rna-EQ Data Analysis on the Receptor Ace2 Expression Reveals The Potential Risk of Different Human Organes VulnerBle TOO 2019 -ncov infection // Front Med 2020 - P. 132-159.

142. Zaouak a, Benmously R, Hammami H, Fenniche S. A Case of Herpes Simplex Virus Reactivity AFTER FRACTIONAL CARBON DIOOXIDE LASER to TREAT AT TREAT AFTER // J COSMET LASER THAT. - 2019. - Vol. 21. - P. 145–146.

143. Zhang H, Tang K, Fang R, Sun Q. What Dermatologists COULD DO COPE with The Novel Coronavirus (Sars-Cov-2): A Dermatologist's Perspective From China // J Eur Acad Dermatol Vener Eol.- 2020. - P. 134 -136.

144. Zumla a, Hui DS, Azhar EI, Memish Za, Maeurer M. Reducing Mortaly From 2019-Ncov: Host-Directed Therapies Should Be an Option // Lancet. - 2020. - Vol. 395. - P. 35–36.