

Features of Humoral Immunity in Patients with Zoonotic Cutaneous Leishmaniasis

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Abstract Cutaneous leishmaniasis (CL), the most commonly reported form of the disease, is identified by ulcerative skin lesions. It is caused by *Leishmania major* transmitted by *Phlebotomus papatasi*, and rodent species *Psammomys obesus*, *Meriones libycus*, *Nesokia indica* and *Rhombomys opimus* serve as non-human reservoirs. Visceral leishmaniasis (VL) is the most severe form of the disease, in which the pathogen disseminates to internal organs such as the liver, spleen, and bone marrow [2,3].

Keywords Visceral leishmaniasis, Leishmanial RNA virus, Pharynx, Larynx, Trachea

1. Introduction

Leishmaniasis occurs in 98 countries around the world. 72 countries of these are developing countries, furthermore, 13 of which are the poorest in the world. Unfortunately, the infection is poorly differentiated and diagnosed, so many cases remain unrecognized. Studies conducted by foreign specialists indicate that the etiological factor of the disease may not be leishmania itself, but the virus contained in it (LRV - leishmanial RNA virus). It was first discovered in 1988 in a patient infected with *L. guyanensis* [1,4,8].

Cutaneous form (CL) is characterized by the appearance of leishmaniomas on the skin as specific granulomas lesions consisting of plasma cells, neutrophils, lymphoid cells, passing through the stages of tubercle-ulcer-scar [9,10,11]. Mucocutaneous leishmaniasis is accompanied by damage to the mucous membranes of the mouth, nose, pharynx, larynx, trachea, spreading to the soft tissue of the lips and cartilage tissue (REF). Diffuse CL manifests itself as multiple infiltrates, papules and nodules on the skin [5,6,9].

2. Purpose of the Study

To identify the characteristics of humoral immunity in patients with zoonotic CL.

3. Materials and Methods

70 patients hospitalized with zoonotic CL from different districts of the Bukhara region Uzbekistan were selected for

observation. The diagnosis of zoonotic CL was established at the initial visit based on the medical history, clinical pictures, physical examination, and analysis of laboratory parameters (What are they?). All studied patients underwent examination and treatment at the regional dermatovenerological dispensary (REF).

Cutaneous leishmaniasis was diagnosed based on skin scraping material (REF). Before sampling, it is necessary to ensure good homeostasis to prevent blood from entering the sample, which is achieved by squeezing the element. The best sampling location is in the immediate vicinity of the ulcer or its active border (REF). Using a sharp scalpel, a superficial incision is made 1-2 mm deep, 5-8 mm long, and the tissue elements and tissue fluid are scraped off with the end of the scalpel (REF). Stained according to Romanovsky-Giemsa (REF).

To identify features in the indicators of humoral immunity before and after treatment, all 70 patients were divided into two groups depending on the method of therapy received: From Bukhara city.

Group I - 35 patients with PCL (Full name) who received standard treatment, which included antiparasitic (scientific name and dose), antimycotic (scientific name and dose), immunomodulators (scientific name and dose), non-steroidal anti-inflammatory drugs (scientific name and dose), as well as local treatment with ointments (scientific name and dose) for 10 days.

Group II – 35 patients with PCL who; in addition to standard treatment, were prescribed a bioactive supplement - L-arginine powder (Source). Children under 10 years old were prescribed L-arginine 250 mg/what? twice a day for 10 days (REF), and over 10 years old 500 mg/what? twice a day for 10 days (REF). These groups were representative in terms of age, clinical forms, and duration of the disease,

which made it possible to obtain objective and reliable results.

Statistical processing of the obtained results was carried out using the methods of variation statistics by the application package Statistica for Windows (REF). Digital data was processed on a personal computer using the memory of Microsoft Excel application programs (REF).

4. Results and Discussions

An immunological study (included what parameters) was carried out on the first day after admission to the hospital before the start of treatment and the analysis of the data is shown in Table 1.

Table 1. Immunological profiles of PCL patients at start of therapeutic regime

Indicators	Group I	Group II
IL 4 (pg/ml)	62,1±3,11	62,1±3,21
IL 18 (pg/ml)	124,27±2,91	111,19±2,96
IgE (IU/ml)	261,14±6,13	265,34±6,54

The data obtained showed that patients with PCL before treatment there were an increase in the concentration of the IL-4 (Full name), both in group I and group II by 2.48 times compared to normal values (how could you determine the normal value when you did not include control group????). IL-18 (Full name), on the other hand, increases by 1.77 and 1.58 times than normal value in group 1 and 2, respectively. IgE (Full name) concentration increased 2.61 and 2.65 times than normal value in group 1 and 2, respectively. Thus, the analysis of the data obtained shows that in zoonotic cutaneous leishmaniasis, changes in the serum concentration of cytokines and IgE are detected, expressed by an increase in the content of the anti-inflammatory cytokine IL-4 and the proinflammatory cytokine IL-18, as well as IgE, which are directly dependent on the clinical form and duration of the disease (REF). This indicates the advisability of including in the complex therapy (Explain the components) of patients with cutaneous leishmaniasis drugs that help correct the indicators of the studied cytokines of the body.

At the end of treatment, similar immunological studies were carried out to determine the levels of cytokines IL-4, IL-18 and IgE.

When studying immunological parameters, it was noted that the timing of the onset of regression of clinical manifestations of leishmaniasis occurred faster when L-arginine was prescribed along with standard treatment.

Table 2. Immunological profiles of PCL patients at the end of therapeutic regime

Indicators	Group I	Group II
IL 4 (pg/ml)	39,9±5,4	34,7±3,75
IL 18 (pg/ml)	102,81±2,96	85,1±4,16
IgE (IU/ml)	239,47±10,46	101,75±10,48

The levels of the anti-inflammatory cytokine IL-4 in group II (34.7 pg/ml) were 1.15 times lower than in group I (39.9 pg/ml), while the proinflammatory cytokine IL-18 in group II (85.1 pg/ml) is 1.21 times lower compared to group I (102.81 pg/ml). IgE values in group II (239.47 IU/ml) are 2.35 times lower than group I (101.75 IU/ml). the use of L-arginine along with standard treatment significantly increased the effectiveness of the treatment, which promotes rapid healing of leishmaniasis ulcers, while immunological parameters have a greater tendency to decrease than in the group with standard treatment. (discuss these finding in relation to previous publication).

5. Conclusions

Zoonotic cutaneous leishmaniasis is expressed by an increase in the content of the anti-inflammatory cytokine IL-4 and the proinflammatory cytokine IL-18, as well as IgE, which are directly dependent on the clinical form and duration of the disease. In patients with PCL before treatment, there was an increase in the concentration of the cytokine IL-4, both in group I and group II by 2.48 times compared to normal values, IL-18 by 1.77 and 1.58 times, IgE by 2.61 and 2.65 times, respectively.

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