

## **EFFECTIVENESS OF ANTIPROTOZOIC THERAPY IN HIV INFECTION WITH INTESTINAL PARASITOSIS**

**Achilova Matlyuba Mirkhamzaevna**

Department of Infectious Diseases

Samarkand State Medical University, Uzbekistan

[achilovamatlyuba.88@mail.ru](mailto:achilovamatlyuba.88@mail.ru)

**Abstract:** Intestinal parasites and helminths cause immunodeficiency in the human body, which directly aggravates the course of the disease in HIV-infected people. The purpose of the study: to study the effect of parasitotherapy on the course of the disease when HIV infection is accompanied by intestinal parasites. Research materials and methods. 70 patients undergoing treatment for HIV infection were examined. General clinical, IFA, PCR, coproovoscopy and formalin sedimentation methods were used for the research. Research results. When intestinal parasitosis and HIV infection occur together, dyspeptic symptoms such as nausea, pain around the navel, loose stools, and urticaria on the skin are more common. Laboratory signs revealed anemia, eosinophilia, and changes in the number of SD4 cells. When anti-parasitic drugs were administered to patients with ART, dyspeptic symptoms, reduction of anemia symptoms, recovery of the immune system were observed. Summary. Intestinal parasites cause more dyspeptic symptoms in HIV-infected patients. It causes an increase in the number of eosinophils and a decrease in the number of SD4+ lymphocytes. A positive change of these indicators is observed in patients who take drugs against intestinal parasites against the background of ART.

**Key words:** parasitic invasion, HIV infection, antiprotozoal therapy, ART

**Relevance.** HIV infection is a chronic infectious disease of a viral nature, which mainly damages the immune system, causes opportunistic infection and tumor development, and ends with death [5]. Among the countries of Central Asia, giardiasis, enterobiosis, blastocystosis are common parasitosis. In some cases, they occur in a mixed form and mainly cause disturbances in the intestinal gastrointestinal function [10]. In the intestines, giardia parasitizes the structure and function of the small intestine, resulting in recurrent or obvious symptoms, such as pain, dyspeptic and asthenovegetative symptoms. Using rational diagnostic tests, giardiasis can be detected in time and proper treatment can be achieved [4]. One of the common intestinal parasites is blastocystosis, which has become one of the main problems due to the increasing number of patients with HIV infection. Because with a decrease in immunity, blastocysts multiply rapidly and cause damage to the digestive system [6].

Currently, the only way to treat HIV infection is highly active antiretroviral therapy (HART) [8]. After the introduction of YuFART, the incidence of a number of opportunistic diseases decreased dramatically, and the quality of life of HIV-infected patients improved and life expectancy increased [12]. In the available literature, there is insufficient information on the use of parasitotherapy in patients with HIV.

**The purpose of the study:** to study the effectiveness of antiprotozoal therapy when HIV infection is accompanied by intestinal parasites.

**Research object.** 70 HIV-infected patients who applied for treatment to the Samarkand Regional Infectious Disease Clinical Hospital and the Samarkand Regional AIDS Center during 2021 were taken for the study.

The studied patients were divided into 2 groups: 40 patients with HIV infection + intestinal parasitosis (intestinal giardiasis, amebiasis, blastocystosis) formed group I (main group) and 30 patients with HIV infection without intestinal parasitosis were found in group II (1-table).

Table 1  
General description of HIV-infected patients studied

Indicator	Group I HIV-infected patients with intestinal parasitosis, n=40		Group II HIV-infected patients without intestinal parasitosis, n=30	
	APT (+) n=20	APT (-) n=20	APT (+) n=15	APT (-) n=15
Male	11 (55,0%)	12 (60,0%)	8 (53,3%)	8 (53,3%)
A woman	9 (45,0)	8 (40,0%)	7 (46,7%)	7 (46,7%)
Clinical stage of HIV infection				
I-clinical stage	1 (5,0%)	-	1 (6,7%)	-
II-clinical stage	5 (25,0)	4 (20,0%)	6 (40,0%)	6 (40,0%)
III-clinical stage	14 (70,0%)	16 (80,0%)	8 (53,3%)	8 (53,3%)
IV-clinical stage	-	-	-	1 (6,7%)

Group I 20 (50%) of 40 (100%) patients receiving antiretroviral therapy (ART) and 20 (50%) not receiving ART, Group II 15 (50%) of 30 (100%) patients receiving ART and 15 (50%) patients not receiving ART. The groups are equivalent in terms of indicators.

20 patients in group I were given drugs against intestinal parasites against the background of ART.

**Research methods.** General clinical: patient complaints, anamnesis and objective examination methods were used in this study. Patients were diagnosed with HIV infection based on the order of the Ministry of Health No. 277 of April 30, 2018 at the Samarkand Regional AIDS Center based on immunoenzyme analysis and immunoblot testing. Blood serum (plasma) was taken as research material.

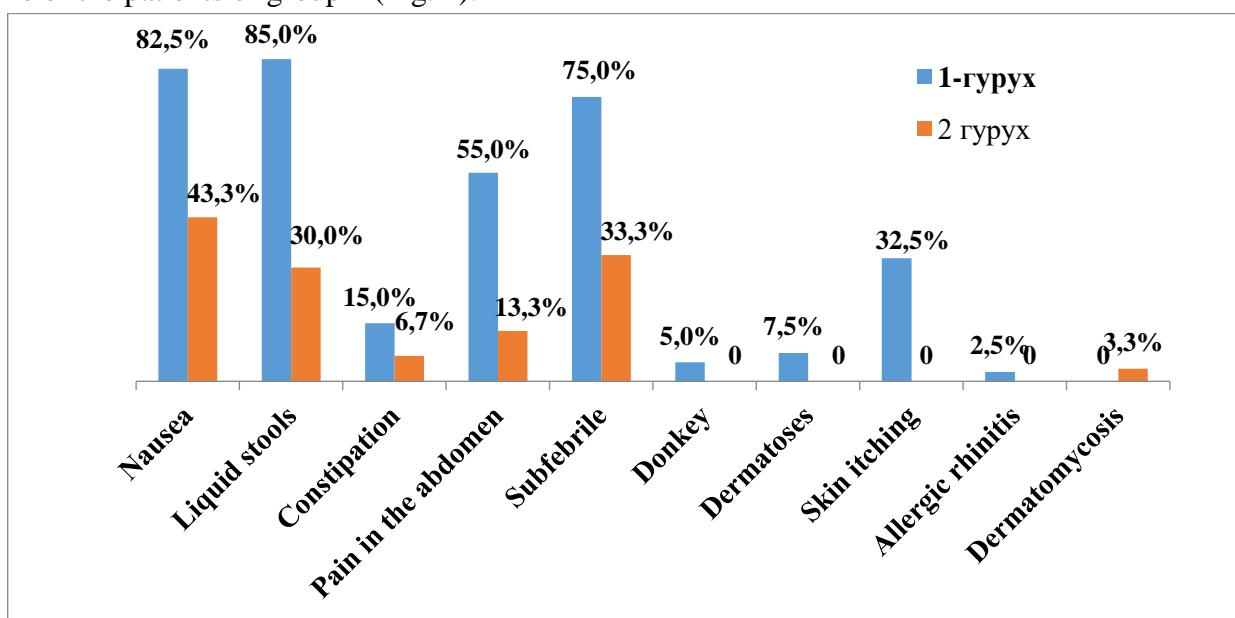
The number of SD4+ cells (T-lymphocytes) in the blood was determined by cytofluorimetry using Becton Dickinson FACS Calibur cytometer technology. The number of HIV RNA in blood plasma (viral load) was determined using the "Votex Rothergy Monitor Test" test system. Parasitic invasion was determined by coprooovoscopy (native/thick drop Kato

and Miur method) and fecal formalin ether sedimentation. The amount of immunoglobulin E in blood serum was determined by IFT.

Microsoft Excel was used for statistical processing of research results.

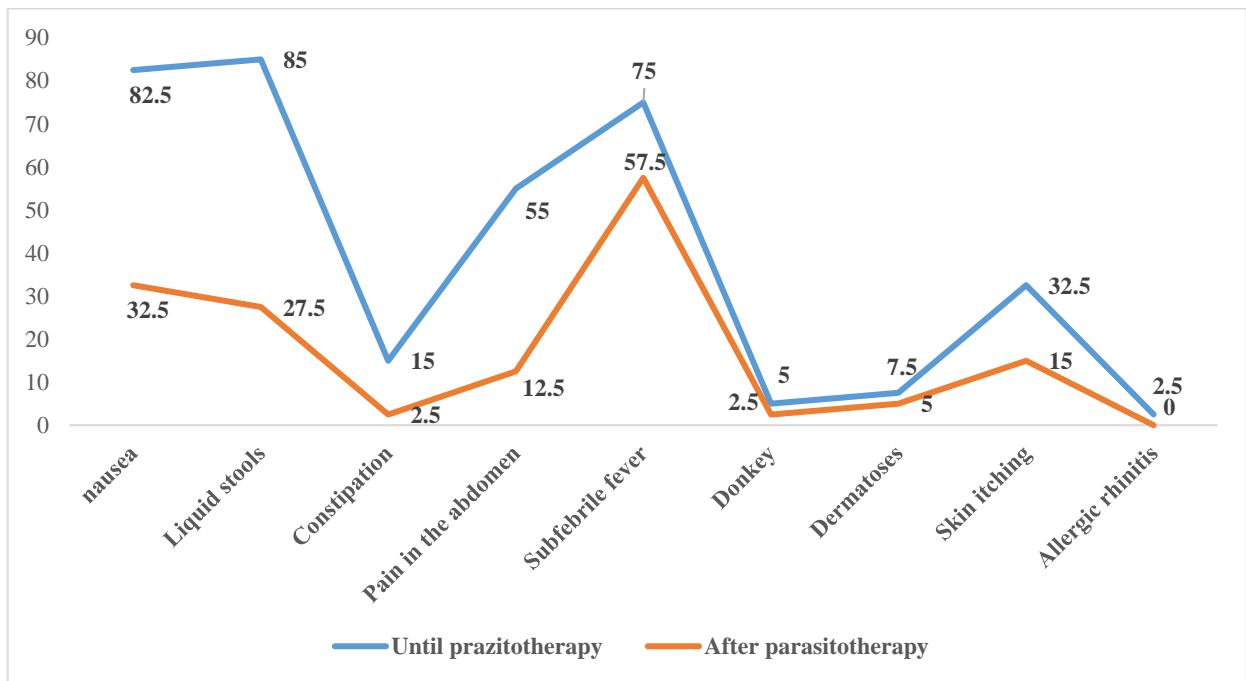
**Research results:** 84.6% of patients with mixed form of HIV infection with intestinal parasitosis of group 1 had nausea, loose stools or constipation, pain in the epigastric area, around the navel, and in the left flank area. Subfebrile temperature was observed in 75.0% of patients in this group.

In group 2, patients with HIV infection had 2 times less complaints of monoinfection, subfebrile fever 33.3% and 2.5 times less than in the comparison group. Allergic symptoms were also typical for intestinal parasitosis, urticaria in 5.0% of patients, dermatosis in 7.5%, skin itching in 32.5%, and allergic rhinitis in one patient. Dermatomycosis was detected in only one of the patients of group 2 (Fig. 1):



Picture 1. Clinical symptoms observed when HIV infection is accompanied by intestinal parasites

When patients in the control group were given an anti-parasitic drug - metronidazole on the basis of the scheme against the background of ART, it was found that the occurrence of clinical symptoms of the disease was significantly reduced (Figure 2).



Picture 2. Clinical signs observed before and after parasitotherapy in case of HIV infection with intestinal parasites

Laboratory tests showed eosinophilia in 65.0% of patients not receiving ART in the group of HIV-infected patients with intestinal parasites, 62.5% of patients receiving ART, and 23.3% of patients in the group without intestinal parasites. In the group of HIV-infected patients without intestinal parasitosis, eosinophilia was not detected in ART patients.

The laboratory parameters described above are presented in the table below (Table 2).

Indicators of laboratory analyses

Table 2

Indicators	Group I HIV-infected patients with intestinal parasitosis, n=40		Group II HIV-infected patients without intestinal parasitosis, n=30	
	APT (+) n=20	APT (-) n=20	APT (+) n=15	APT (-) n=15
Hemoglobin (г/л)	92,6	89,2	112,4	93,2
Erythrocytes ( $10^{12}/\text{л}$ )	3,2	3,04	5,0	3,8
Leukocytes ( $10^9/\text{л}$ )	6,8	5,6	6,2	5,18
Lymphocytes ( $10^9/\text{л}$ )	1,8	1,2	1,5	1,3
Neutrophils ( $10^9/\text{л}$ )	3,42	2,86	4,06	4,06
Basophils ( $10^9/\text{л}$ )	0,03	0	0,02	0,02*
Eosinophils ( $10^9/\text{л}$ )	4,3	5,26	4,1*	2,24*
Platelets (cell/ml)	182,6	178,4	196,4	214,8
ECH (mm/h)	11,8	9,8	10,6	11,6

Note: \* - confidence difference between HIV-infected patients with and without intestinal parasites is  $<0.05$

No significant difference was found between study groups in general clinical laboratory parameters (except for eosinophils).

A difference was found between laboratory indicators of anemia and eosinophils in patients receiving antiparasitic drugs against the background of ART. An increase in the number of SD4+ cells was detected (Table 3).

Table 3  
Indicators of laboratory analyzes before and after parasitotherapy

Indicators	Until parasitotherapy	After parasitotherapy
Hemoglobin (г/л)	92,6	108,3
Erythrocytes ( $10^{12}/\text{л}$ )	3,2	3,6
Leukocytes ( $10^9/\text{л}$ )	6,8	7,6
Lymphocytes ( $10^9/\text{л}$ )	1,8	1,8
Neutrophils ( $10^9/\text{л}$ )	3,42	4,12
Basophils ( $10^9/\text{л}$ )	0,03	0,02
Eosinophils ( $10^9/\text{л}$ )	0,3	0,5
Platelets (cell/ml)	182,6	216,2
ECH (mm/h)	11,8	9,14
SD4+ cells (1 ml/well)	216-393	348-568

In patient registration, the number of T-lymphocytes (T-helpers) with SD4+ receptors was determined in patients with HIV infection. The number of SD4+ lymphocytes was 216-393 cells per 1 ml of blood in the main group of HIV-infected patients with intestinal parasites, while this indicator was 446-567 cells per 1 ml of blood in HIV-infected patients without intestinal parasites.

It was found that the number of SD4+ lymphocytes was 262-501 cells per 1 ml of blood 1 month after treatment in HIV-infected patients with intestinal parasitosis. The number of SD4+ lymphocytes in patients receiving antiparasitic drugs on the background of ART was 348-568 cells per 1 ml of blood.

**Summary.** Thus, intestinal parasites cause more dyspeptic symptoms in HIV-infected patients. It causes an increase in the amount of eosinophils from laboratory indicators. It has a negative effect on the immune system of patients, causing a decrease in the number of SD4+ lymphocytes. A positive change in these indicators is observed in patients taking drugs against intestinal parasites against the background of ART.

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