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NEUROLOGICAL CHANGES IN HIV INFECTION

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Abstract
One of the target organs of HIV is the nervous system: only 1/10,000 of the peripheral blood lymphocytes of AIDS patients are infected with the virus, while in brain tissue HIV affects every hundredth cell. Accordingly, one of the common manifestations of HIV/AIDS is damage to the nervous system. Neurological complications of HIV infection may be caused either by the retrovirus itself or by opportunistic infections, tumors, cerebrovascular pathology, and the toxic effects of antiretroviral drugs. The article analyzes the clinical and epidemiological features of HIV infection, damage to the nervous system in AIDS, the course of opportunistic infections, and their specific treatment among the adult population of the Samarkand region.

Keywords: HIV infection, opportunistic infections, AIDS, characteristics, prevalence, nervous system, ART.

Introduction

HIV infection is one of the most widespread infections and is currently officially registered in all countries of the world. Preventing the spread of HIV infection occupies a special place among public health problems, which is due to the global growth of HIV infection, the significant socioeconomic consequences of the epidemic, the absence of reliable specific prevention measures, and the considerable costs of treatment (2, 3). In Russia, the total number of infected citizens in 2018 was 1,272,403. The incidence rate in the first half of 2018 in Russia was 35.2 per 100,000 population. The prevalence of HIV infection in 2018 was 666.1 per 100,000 population.

The current situation with HIV infection in Uzbekistan cannot be analyzed separately from the global situation. According to the official statistics of the Republican AIDS Center, as of January 1, 2018, 37,872 people with HIV infection were registered in the Republic of Uzbekistan (56% men and 44% women). At the same time, the share of the parenteral route of transmission was 40.6%, sexual transmission accounted for 41.8%, and vertical transmission accounted for 3.4%. The age group from 18 to 59 years is the most susceptible to infection. The prevalence of HIV infection is only 0.1% of the population, and the total number of HIV-infected persons is 109 per 100,000 inhabitants. A significant increase in HIV testing coverage, from 795,481 people in 2008 to 2,536,872 people in 2013, led to an increase in the detection rate of HIV. Insufficient awareness of HIV and prevention measures remains one of the main reasons for the spread of the virus among the population.

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Aim of the Study:

To characterize the clinical and epidemiological data of patients with HIV/AIDS infection, taking into account secondary diseases and opportunistic infections, based on the data of the Samarkand Regional Infectious Diseases Hospital for 2017-2018.

Materials and Methods:

The material for the study and analysis consisted of 145 seropositive patients treated at the regional infectious diseases hospital in 2017-2018. Data from patients' medical records were used for the study.

All patients with HIV infection underwent general clinical and laboratory examinations, including general blood, urine, and stool tests; an extended biochemical blood test; serological blood testing for hepatitis B and C markers; and ELISA diagnosis for HIV infection. Among nonspecific methods, immunological studies were performed to determine the absolute number of CD4+ lymphocytes; these tests were carried out at the Regional AIDS Center in Samarkand.

The fact of HIV infection in all examined patients was confirmed using reference ELISA test systems in an MRW-AM60 multireagent washer and Washer 203, as well as immunoblotting using test systems in an Elmi-ST-3 thermostated shaker. Enzyme-linked immunosorbent assay was performed using equipment manufactured by Rider Technologies, USA. Laboratory diagnostic examination by ELISA for HBV markers (HBsAg) and HCV markers (HCV-Ag, HCV-IgM) was carried out using the above-mentioned equipment.

A complete blood count was performed using a photoelectric colorimeter with determination of 12 blood cell parameters. Biochemical blood parameters were studied on a KPD 89 biochemical analyzer with determination of total and direct bilirubin, ALT, and AST. In this work, methods of epidemiological and clinical-diagnostic analysis were used for the relevant population categories, and the territories of the district were ranked taking into account the intensity of the epidemiological process. The diagnoses of HIV infection and opportunistic infections were established according to the international classification, taking into account clinical symptoms, and were confirmed by laboratory data obtained in accordance with the current instructions of the Regional AIDS Center.

Results and Discussion:

A predominance of the disease among males was shown: 94 patients (64.8%), compared with 51 females (35.1%). Among them, 85 patients (58.6%) were urban residents, and 80 patients (55.1%) were residents of districts and rural areas.

The indicators below show the distribution of seropositive patients who received inpatient treatment at the Samarkand Regional Infectious Diseases Hospital by age category, territorial prevalence, and clinical diagnoses (Figure 1).

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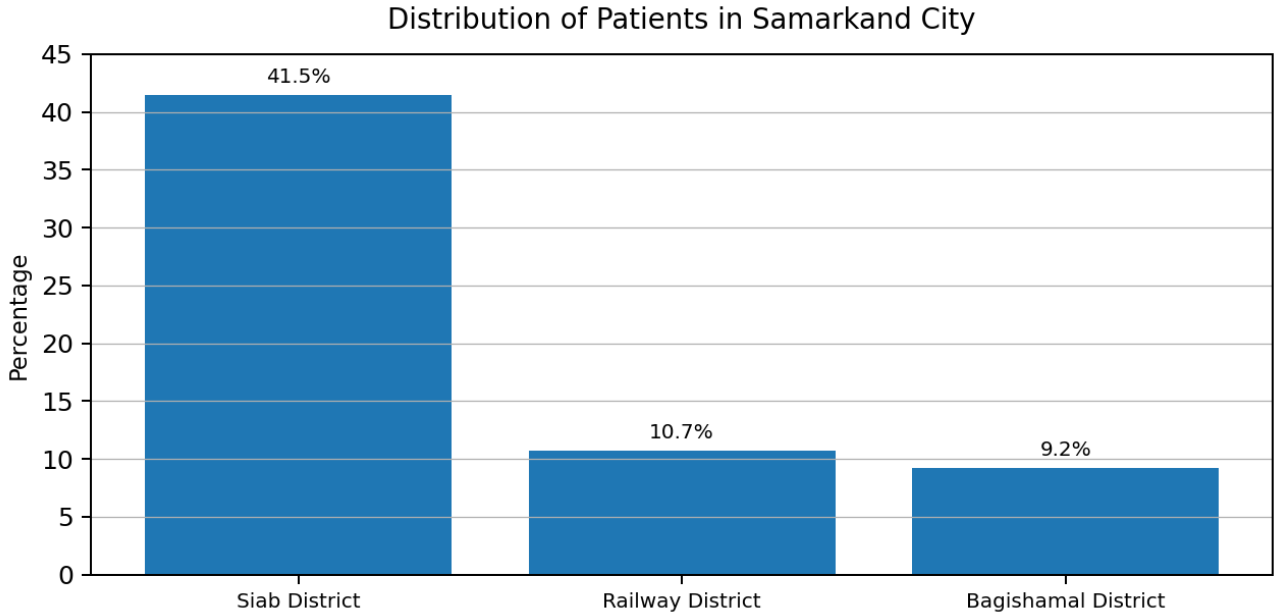

Figure 1. Distribution indicators of patients in Samarkand city

As can be seen from Figure 1, analysis of the dynamics of HIV prevalence in the region shows an increase in the proportion of urban residents - 58.6% in relation to rural residents - 55.1%. According to the data for Samarkand city, the highest percentage of patients who sought medical care was observed in Siab District.

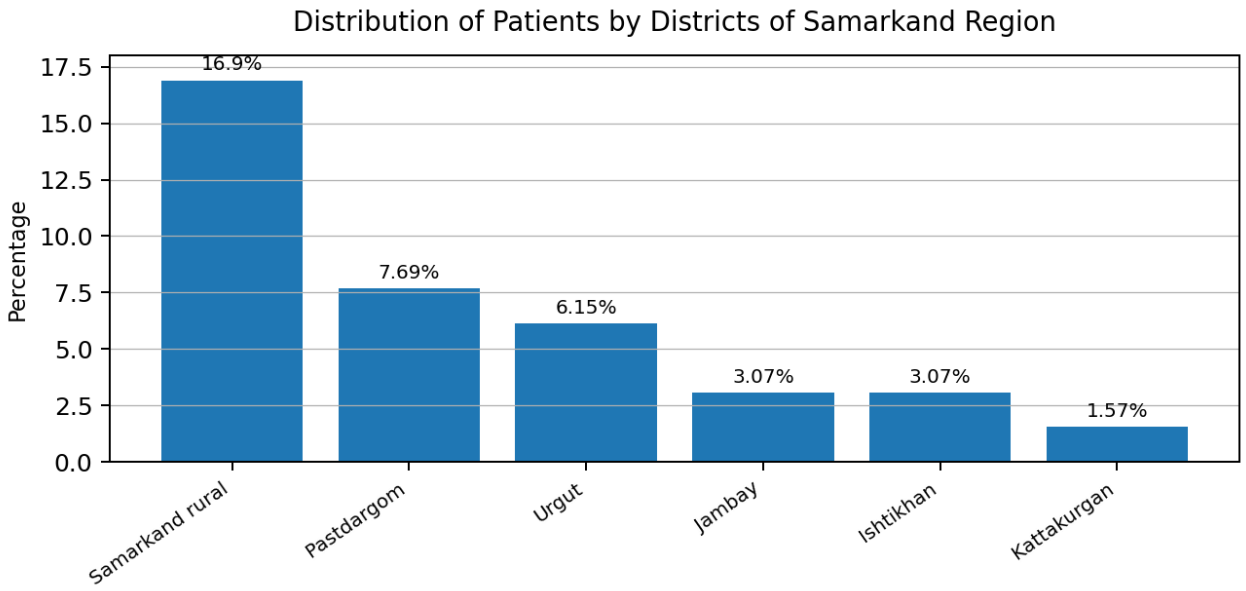

Figure 2. Distribution of patients by districts of Samarkand region

The district distribution data showed a high percentage of patients who sought medical care from the Samarkand rural district.

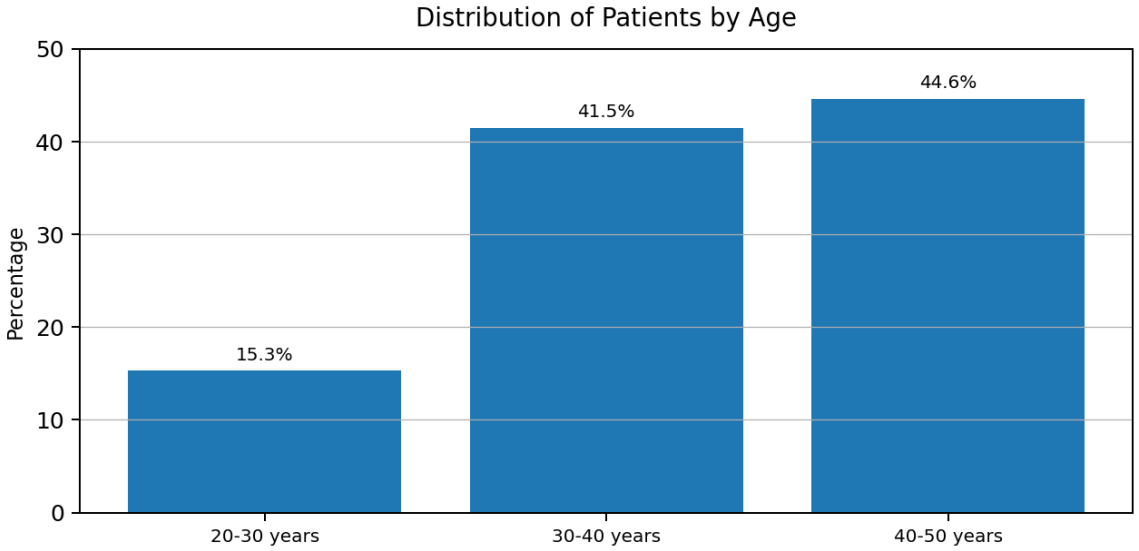

Figure 3. Distribution of patients by age

When distributing patients by age category, we found that the highest incidence rate corresponded to the age group of 40 to 50 years, which accounted for 64 patients (44.1%) (Figure 3).

Upon admission to the clinic, patients were examined by a physician; the patients' complaints, life and disease history, objective data, and laboratory results were assessed. The leading complaints on admission were fever syndrome in 145 patients (100%); asthenic syndrome was also observed in all admitted patients; lymphadenopathy syndrome was noted in 141 patients (97.2%); hepatosplenomegaly syndrome in 69 patients (47.5%); chronic fatigue syndrome in 127 patients (87.5%); and neurological syndrome was detected in 140 patients (96.5%).

All 145 patients were admitted to the hospital with varying degrees of fever, ranging from 37.2 to 40.0°C. Analysis of body weight deficiency showed that a deficit of less than 10% was observed in 61 patients (42%), while a deficit of more than 10% was observed in 77 patients (53.1%). Severe weight deficit with cachexia was noted in 17 patients (11.2%). The normal number of CD4+ lymphocytes ranges from 800 to 1,500 cells per 1 ml of blood. A decrease in this indicator to 760-633 cells was observed in 62 patients (42.7%); to 633-510 cells in 44 patients (30.3%); and to 510 cells or lower in 39 patients (26.8%).

Examination of hemoglobin levels in peripheral blood showed that a level of 100-90 g/L was recorded in 65 patients (44.8%), 90-80 g/L in 57 patients (39.3%), and 80-70 g/L in 23 patients (15.8%). The lymphocyte count study showed that 50-40% lymphocytes were present in 79 patients (54.4%), 40-30% in 45 patients (31.0%), 30-20% in 14 patients (9.6%), and 20% or lower in 7 patients (4.82%). Biochemical blood testing was performed in 56 patients (38.6%) with liver pathology, when elevated bilirubin and enzyme levels were detected.

After objective examination and laboratory testing, the patients were prescribed antiretroviral therapy. During antiretroviral therapy, drugs were prescribed according to the standard regimen.

Antiretroviral therapy included three main groups of drugs: nucleoside reverse transcriptase inhibitors (NRTIs), non-nucleoside reverse transcriptase inhibitors (NNRTIs), and protease inhibitors (PIs). From the NRTI group, azidothymidine, zalcitabine, didanosine, lamivudine, stavudine, and timazide

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were mainly used. From the NNRTI group, patients received saquinavir, indinavir, ritonavir, nelfinavir, and loviride. From the PI group, patients received saquinavir, indinavir, ritonavir, nelfinavir, and abacavir. Immediately before the start of antiretroviral therapy, the CD4+ cell count was determined twice.

Of the 145 patients admitted for inpatient treatment, 73 received antiretroviral therapy (ART). Of these, 28 patients received treatment according to the regimen lamivudine + tenofovir + efavirenz; 24 patients according to the regimen lamivudine + zidovudine; 16 patients according to the regimen lamivudine + abacavir; and 5 patients according to the regimen lamivudine + tenofovir.

As a result of the treatment conducted at the Samarkand Regional Infectious Diseases Hospital, 127 of the 145 patients (87.5%) were discharged in satisfactory condition, 9 patients (6.2%) were transferred to other medical institutions, 6 patients (4.13%) left the hospital without permission, and 3 patients (2%) were taken home in severe condition.

In general, regional differences in the level of HIV infection prevalence are characteristic of the Samarkand region, with an increase in the proportion of urban residents compared with rural residents. According to the data for Samarkand city, most patients sought medical care from Siab District. District distribution data showed a high percentage of patients who sought medical care from the Samarkand rural district. The incidence and prevalence of HIV infection in different territories and among different population groups are constantly changing.

Among the patients, males were more numerous - 94 (64.8%) compared with females - 51 (35.1%). By age category, the highest incidence rate was observed among persons aged 40 to 50 years. According to clinical diagnoses, the highest rate of concomitant opportunistic diseases was noted in patients diagnosed with chronic gastroenterocolitis - 21 patients (14.4%); chronic hepatitis of unspecified etiology - 14 (9.6%); fever of unknown origin - 15 (10.3%); liver cirrhosis of unspecified etiology - 15 (10.3%); persistent diarrhea and persistent fever - 12 patients (8.27%); acute gastroenterocolitis - 10 (6.89%); acute gastroenteritis - 9 patients (6.2%); chronic hepatitis C - 9 patients (6.2%); chronic hepatitis B - 9 patients (6.2%); chronic hepatitis B + C - 8 patients (5.5%); chronic bronchitis - 6 (4.1%); and herpetic infection, namely herpes zoster - 4 patients (2.75%).

Coinfection may negatively affect the course of HIV infection. In turn, HIV infection accelerates the course of viral hepatitis and significantly increases the risk of developing hepatocellular carcinoma. Body weight deficiency in most patients was more than 10% in 77 patients (53.1%), less than 10% in 61 patients (42%), and 17 patients (11.2%) were admitted with severe cachexia. This means that most patients were admitted at clinical stages 3-4 of HIV infection. Mild anemia was detected in 65 patients (44.8%), moderate anemia in 57 patients (39.3%), and severe anemia in 23 patients (15.8%).

To study the dynamics of the epidemic process in individual territories, it is necessary to organize and use continuous epidemiological monitoring and behavioral studies to identify sources of HIV by testing for viral markers in population groups with intensive HIV infection. The introduction of prevention programs among vulnerable population groups prevents HIV infection in these groups and reduces the risk of HIV infection among representatives of the general population. It is also necessary to increase citizens' awareness of HIV, provide information about methods of protection, form an adequate perception of personal risk, and motivate changes in risky behavior using schemes and illustrations with examples in various places.

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Conclusion:

The results of the study showed that the progression of HIV infection is promoted by opportunistic infections; in other words, worsening immunodeficiency leads to a decrease in patients' quality of life. In this regard, neurological changes are observed in most patients. When managing such patients, we must take into account the psychoemotional state of the patient.

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Appendix: Data Used for Figures

Figure 1 data

District	Percentage
Siab District	41.5%
Railway District	10.7%
Bagishamal District	9.2%

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Figure 2 data

District	Percentage
Samarkand rural	16.9%
Pastdargom	7.69%
Urgut	6.15%
Jambay	3.07%
Ishtikhan	3.07%
Kattakurgan	1.57%

Figure 3 data

Age group	Percentage
20-30 years	15.3%
30-40 years	41.5%
40-50 years	44.6%

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