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## PERIODONTAL STATE AND OPTIMIZATION OF PROSTHODONTIC DENTAL CARE IN HIV-INFECTED PATIENTS

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**Abstract** Due to the fact that the provision of dental care to HIV-infected patients should be carried out with minimal invasive interventions, due to the high risk of transmission of the pathogen during manipulations, it seems very relevant to consider the issues of providing prosthetic dental therapy using modern materials that do not provide irritating, toxic and allergic effects on the mucous membrane of the oral cavity, and also do not require additional preparation during the manufacture of prostheses, as well as overloading the abutment teeth.

In this regard, based on the results of our research, preference was given to the manufacture of removable structures. To replace dentition defects, «Ftorax» base plastic and «Vertex Thermo Sens» thermoplastic base material were used.

When choosing the design of dentures in HIV-infected patients, the endurance of the periodontal teeth to loads was taken into accounts, which were determined using gnatodynamometric studies.

When carrying out complex therapy, coupled with dental orthopedic therapy, there was a significant clinical improvement accompanied by normalization of both the general condition of patients and positive shifts in the dynamics of periodontal endurance to pressure.

**Keywords:** HIV infection, periodontal condition, gnatodynamometry, orthopedic dental therapy.

**Introduction.** Diseases of the oral cavity against the background of HIV infection have vivid manifestations, sometimes with an atypical nature of the course [2,3]. In patients with a reduced immune status, which include HIV-infected, there is a high probability of the simultaneous existence of several infections, including in the maxillofacial region, which significantly complicates the diagnosis of diseases.

At the same time, periodontal diseases are one of the typical manifestations in patients infected with HIV, and one of the main reasons for premature tooth loss and destruction of the dentition [4].

Dental therapy of oral diseases in HIV-infected patients is complicated by the state of progressive immunodeficiency caused by HIV carriage against the background of pressure from concomitant infections, massive use of antibiotics and other chemotherapeutic agents and has its own characteristics.

HIV-associated patients are prescribed large doses of drugs, increase the duration of their use, and carry out targeted prophylactic administration [6, 7].

The success of dental treatment and prevention of secondary adentia, which is a consequence of caries and periodontal diseases, by replacing dentition defects with removable and fixed structures of dentures, depends on the correct preparation of the orthopedic treatment plan, on the choice of an adequate design of dentures and materials, on their hygienic state [1]

However, analysis of the literature shows that the issues of providing prosthetic dental care to people living with HIV continue to remain little or almost unexplored.

Meanwhile, scientific research in this area would make it possible to develop a tactic of approach to assessing the state of the oral cavity in HIV-infected patients and the peculiarities of the provision of dental, including orthopedic, care, starting with the solution of the issues of indications and contraindications to dental prosthetics, the timing of treatment, the choice methods, designs, materials for the manufacture of dentures, as well as the features of oral care, dentures and tissues of the prosthetic bed [5].

**Objective of the study:** optimization of orthopedic dental care in HIV-infected patients. **The object of the study** was HIV-infected patients. The study included 67 patients aged 20 to 50 years and 14 volunteers aged 30 to 50 years, not infected with HIV. We examined HIV-infected patients with III and IV stages of HIV who were registered and inpatient treatment at the Republican Center for the Fight against AIDS and at the Research Institute of Virology of the ANRUz.

The examined 81 patients were divided into 3 groups:

1-group of 14 patients not infected with HIV;

2-group of 31 patients, HIV-infected with III stage of the disease;

3-group of 36 patients, HIV-infected with stage IV disease.

**Results.** In HIV-infected patients in group 2, the following inflammatory periodontal diseases were revealed: gingivitis, including catarrhal – in 56.8% of patients. Periodontitis was observed in 18% of patients. Mild periodontal inflammation in patients with HIV in group 2 was detected in 30.4% of patients, PI being  $0.93 \pm 0.25$ . Periodontitis of moderate severity (PI 1.89 ± 0.21) with pronounced destruction, confirmed by X-ray, was observed in 52.2% of patients. Severe periodontitis was noted in 17.4% of the total number of patients with periodontitis. PI in these cases was  $2.41 \pm 0.26$ . The average value of the periodontal index in this group of patients was  $1.74 \pm 0.29$ . The depth of clinical pockets averaged 5.8 mm, which corresponds to 3 points on the CPITN scale.

Inflammatory periodontal diseases in patients with HIV in group 3 were presented as follows: gingivitis, including catarrhal, was observed in 61.4% of patients, necrotizing ulcers – in 6.3% of those examined. A mild form of periodontal inflammation was observed in 27.5% of patients, with a PI of  $0.98 \pm 0.27$ . Moderate periodontitis (PI 2.1 ± 0.24) was observed in 52.3% of the examined patients. Severe periodontitis was noted by us in 20.2% of cases, when the PI value was  $2.8 \pm 0.24$ . The average value of the periodontal index was recorded at the level of  $1.96 \pm 0.23$ .

The intensity of inflammatory periodontal diseases in the groups of HIV-infected patients was high compared to group I, which is primarily due to severe immunodeficiency. Against the background of immunosuppression, destructive changes in the hard tissues of the teeth were also noted, which led to the formation of a large number of missing and destroyed teeth as a result of complicated caries, and this, in turn, contributed to the overload and disruption of periodontal trophism.

The results of determining the endurance of the periodontium to loads (by the method of gnatodynamometry) showed that in patients with HIV infection in group 2, the difference in vertical stability between incisors and molars was 1.04 kg; between incisors and canines and incisors and premolars – 1.99 and 1.49 kg, respectively ( $p \le 0.05$  compared with intact periodontium).

Against the background of severe immunodeficiency in patients with HIV in group 3, significant disturbances in periodontal endurance were observed: the difference in vertical stability between incisors and molars was 0.82 kg; between incisors and canines and incisors and premolars - 1.73 and 1.13 kg, respectively ( $p \le 0.05$  compared with intact periodontium).

When studying the resistance of teeth to horizontal loads, a similar trend was found. In patients of group 1 in intact periodontium, the resistance of molars to horizontal loads exceeded that of incisors by 2.25 kg; the corresponding excess in patients with HIV infection in group 2 was 0.3 kg, in patients in group 3 - 0.27 kg. The difference in horizontal stability between incisors and canines and incisors and premolars is 1.0 and 0.95 kg in the intact periodontium, respectively; a similar difference in patients in group 2 was 0.08 and 0.18 kg, in patients with HIV in group 3 - 0.06 and 0.16 kg (p $\leq 0.05$  compared with intact periodontium).

It is obvious that HIV infection leads to severe changes in the functional state of the periodontal complex, which is manifested by a sharp drop in the periodontal endurance to stress and loss of stress differentiation in different groups of teeth. The leveling of gnathodynamometry indices in different groups of teeth indicates a decrease in the functional state of the periodontium.

Due to the significant number of teeth destroyed as a result of the carious process and extracted teeth in HIV patients; there was an increase in the proportion of people with secondary edentulousness and needing prosthetics. Moreover, in both groups of HIV-infected patients, the provision with prostheses was extremely low.

The quality of the prostheses was at the same level. On the day of examination, 21.2% of HIV-infected patients needed fixed dental prosthetics (bridging). In accordance with the size and localization of the dentition defect, 26 (78.8%) patients with HIV needed partial removable and removable dentures.

So, after treatment, which included both pathogenetic and symptomatic therapy, including orthopedic treatment, the periodontal PI index was  $0.87 \pm 0.18$  in the control group; in HIV-infected patients whose dentition defects were replaced with prostheses based on thermoplastic material «Ftorax» and «Vertex termo sens», PI was equal to 0.54  $\pm 0.15$  (p≤0.01 compared with the data before treatment; p ≤0.05 between groups).

The obtained clinical and laboratory data on the state of the tissues of the prosthetic bed make it possible to recommend, for replacing defects in the dentition in people living with HIV, prostheses made of thermoplastic material «Vertex termo sens», as a method of choice, according to the results of our research, their use significantly increases the efficiency of performed activities.

Thus, the planning of treatment for HIV-infected patients should be based on the joint work of all medical services, i.e. Improvement of dental care should be carried out along the way of improving the quality of treatment of major dental diseases against the background of path genetically and symptomatically justified therapy.

It should be noted that due to the fact that the provision of dental care to HIVinfected patients should be carried out with minimal invasive interventions, due to the high risk of transmission of the pathogen during manipulations, it seems very relevant to consider the issue of providing orthopedic treatment using modern materials that do not provide irritation. Toxic and allergic effects on the oral mucosa, as well as additional preparation and overloading of supporting teeth that do not require additional preparation during the manufacture of prostheses.

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