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PREDICTORS OF ANTITOXIC IMMUNITY AGAINST DIPHTHERIA IN ADULT PEOPLE LIVING WITH HIV

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Introduction. Due to ART, the life expectancy and life quality of people living with HIV (PLHIV) can be compared with HIV negative people, so it is important to consider the main issues of primary care for adult PLHIV. Measures to ensure the health of PLHIV include immunization, which is a priority in health policy in developed countries. Diphtheria is a disease that is effectively managed with immunoprophylaxis [1, 2, 3].

Studies of antitoxic diphtheria immunity among adult PLHIV in the world are few, and in Ukraine such a study is conducted for the first time, which determines the relevance of the chosen topic.

The aim of the study was to assess the intensity of immunity against diphtheria in adult PLHIV and to investigate its relationship with the main clinical and laboratory indicators to determine the predictors of the integrated use of these factors.

Materials and methods. The study included 90 PLHIV aged 22 to 60 years, the average age was 40.1±0.9 years, of which women were 51 (56.7%), men – 39 (43.3%) persons. The control group included 49 healthy immunocompetent volunteers of the appropriate age group and gender composition. Diagnostic test

systems RIDASCREEN Diphtheria IgG (R-Biopharm AG, Germany) were used to estimate the immunity strengths to diphtheria by means of immunoassay (ELISA). The examination was carried out in compliance with the manufacturer's instructions. The immunity status against tetanus was estimated by determining the concentration of antibodies in IU/ml. Assessment of anti-diphtheria immunity strengths was carried out as follows: up to 0.1 IU/ml – protection absent; 0.1-0.9 IU/ml – minimum level of protection; 1.0-1.4 IU/ml – moderate level of protection; 1.5 IU/ml and above – high level of protection. Statistical processing of the results was performed using the licensed computer program STATISTICA v.6.1.

Results of the research. We found that the median of diphtheria antibodies among adult PLHIV was 0.17 (0.09 - 0.38) IU/ml, which is 6.1 times lower than in the control group – 1.03 (0.56 - 1.27) IU/ml ($p<0.001$ by U-test). For in-depth analysis, all adult PLHIV were divided into 3 groups taking into account the intensity of antitoxic anti-diphtheria immunity. Thus, the median of diphtheria IgG in the group with no protection (group I) was 0.06 (0.04-0.09) IU/ml, in the group with a minimum level of protection (group II) was 0.26 (0.16-0.39) IU/ml and in the group with medium and high level of protection was 1.35 (1.08-1.62) IU/ml. Accordingly, there was a significant difference in the levels of anti-diphtheria antibodies in 3 groups (p_H <0.001).

In more in-depth analysis of immunological, clinical and laboratory parameters that can affect the intensity of antitoxic immunity, the following data were obtained.

Low levels of diphtheria antibodies significantly (from $p<0.05$ to $p<0.001$) is associated with anemia, thrombocytopenia, elevated ESR, low levels of T-helpers (nadir), the presence of tongue leukoplakia, body weight deficit, smoking, older age of PLHIV. The greatest protective opportunities to increase the level of anti-diphtheria immunity in adult PLHIV, respectively, include the absence of hairy leukoplakia of the tongue (r_s=-0.23; p=0.030), smoking cessation (r_s=-0.26; p=0.013), normal laboratory blood counts (hemoglobin level – r_s=0.25; p=0.02, platelets – r_s=0.41; p<0.001, ESR – r_s=-0.55; p<0.001) and body weight – r_s=0.31; p=0.003), as well as more T-helpers (nadir) – (r_s=0.49;p<0.001).

It was found that the clinical stage of HIV infection (r_s=0.13; p=0.238) viral load (r_s=0.02; p=0.852), receiving ART (r_s=0.07; p=0.511) and adherence to ART (r_s=0.04; p=0.684) had no significant relationship with the intensity of antidiphtheria immunity.

Conclusions. Adult PLHIV constitute a risk group for potential diphtheria as they have low specific immunity. A comprehensive assessment of these factors will allow, without conducting special studies, to identify risk groups that require vaccination against diphtheria.

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