

**UDC: 578.825.13:616.22\*321-002-021.1**

**HUMAN HERPESVIRUS TYPE 6 AND ITS  
INFECTION LEVEL AT THE PATIENTS WITH  
LARYNGOPHARYNGEAL DISEASE**

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Human herpesvirus type 6 (HHV-6) was discovered at the end of the 20th century in the leukocytes of the patients with lymphoproliferative diseases [1].

A new pathogen of Herpesviridae family has attributed to Betaherpesvirinae subfamily, Roseolovirus species. Seroepidemiological investigations have proven ubiquitous dissemination of HHV-6 [2-5]. Its high neuroinvasive potential manifesting by central nervous system (CNS) disorders (febrile seizures, meningitis, encephalitis, myelitis) has been established [4-6].

Several reports have discussed a possible role of HHV-6 in multiple sclerosis [6-8]. Human herpesvirus type 6 may also play a role in human fatigue syndrome and epilepsy [4, 8].

The large number of unsolved questions about the spectrum of the disorders associated with HHV-6 require expanded knowledge about the recently discovered virus and its association with the above diseases. As early as 1996, the leading specialists, which investigated different aspects of herpesvirus infection management, emphasized an increased significance of HHV-6 among the group of other herpesviruses, i.e. type 4, 5, 7, 8, for human infectious pathology. It was noted the necessity of consideration the questions of seroprevalence of the population to these viruses and revealing the populations with the highest risk of infection development. It was emphasized also an importance of working out the strategy for control and prevention of herpesvirus diseases [9].

Several differences in biological and molecular properties as well as the peculiarities of seroepidemiological observations have allowed to discover two variants of HHV-6: HHV-6 A and HHV-6 B [10]. They differ significantly in a number of clinical and epidemiological characteristics [5]. HHV-6 B was documented in an overwhelming number of primary HHV-6 infections while HHV-6 A has been poorly investigated and its role has not been determined. In the majority of cases this variant was isolated from immunocompromised hosts such as HIV infected patients and those with AIDS [3, 4].

The majority of researchers state that HHV-6 B is the cause of Roseola infantum (exanthem subitum) which occurs as a primary infection in early childhood [2-6, 11].

The findings of seroepidemiological investigations demonstrate that by the age of 12 months more than 90 % of immunocompetent children are infected with HHV-6 B, practically all of them become seropositive by the age of 3 years [2]. It should be mentioned that high seropositivism of the population to HHV-6 B and frequent carriage of the virus in the saliva

were proved by the end of the 20th century [12, 13]. But the works of that time note describe HHV-6 B because of the absence of the methods of the virus differentiation.

New data about their cell and molecular biology, methods of specific diagnosis, possibility to differentiate infections caused by HHV-6 A and HHV-6 B, epidemiological and immune properties of the virus and the role of HHV-6 in other pathological processes were reported at the 5th International Conference on Herpesviruses type 6 and 7 (May 1-3 2006, Barcelona Spain). Great importance was presented to the work proving the necessity to revise the existing division of HHV-6 into two variants and to consider them separate herpesviruses with the account of new information about the difference in their biological properties [8].

The works dealing with the role of HHV-6 in infection and morbidity of the population are not numerous in Ukraine [14, 15].

Thus, lack of information about HHV-6 and diseases associated with it, tropism to oropharyngeal epithelium, the data about high frequency of carriage in the saliva [13, 14], possibility to isolate the herpesvirus from the oropharynx [16] necessitated our work.

The purpose of the work was to determine the level of infection with human herpesvirus type 6 in patients with acute and chronic inflammatory diseases of the pharynx and larynx.

#### **Materials and methods**

Our clinical and serological investigation involved 65 patients with acute and chronic inflammatory diseases of the pharynx and larynx. The majority of the patients (64 persons) were of 20-70 years of age. They were treated as out-patients or in-patients at City Clinical Hospital No 30 (Kharkiv), the hospital of Otorhinolaryngology Department of Kharkiv Medical Academy of Postgraduate Education, within the period of 2006-2007. The clinical diagnosis of the patients is given in the table together with the findings of the laboratory analysis. The controls were 22 age-matched healthy subjects.

Ig G to HHV-6 in the blood serum of the patients was determined using immunoenzyme assay (IEA) with a commercially available diagnostic system "Vecto HHV-6 - Ig G" (Russia). Some patients were investigated for herpes simplex virus by determining Ig M and Ig G using test-systems "Vecto HSV - Ig M" and "Vecto HSV - Ig G" (Russia).

IEA findings were obtained using spectrophotometer by determining optic density (OD) in optic units in the experimental and control samples of the blood serum. The findings of the performed screening were assessed according to the guides for the test-systems with obligatory consideration of the case history data and the clinical findings of the investigated patients. In case of high blood Ig G to HHV-6 level their quantitative amount was calculated using the formula given in the guide for the test-system.

#### **Results and discussion**

The findings of serological investigation of Ig G to HHV-6 in the 65 patients with acute and chronic inflammatory diseases of the pharynx and larynx as well as the healthy subjects are presented in the Table.

**Table - Results of detection Ig G to HHV-6 in the blood serum of patients with acute and chronic pathology of the larynx and pharynx**

Clinical diagnosis of investigated patients		Number of investigated patients	Number of patients with detected of anti-HHV-6 Ig G in the blood serum	
			Absolute number	% ± m
Laryngitis	acute	17	8	47,1 ± 2,1
	chronic	31	20	64,5 ± 2,7
Pharyngitis	acute	4	4	
	chronic	6	6	
Laryngopharyngitis		7	7	
Total		65	45	69,2 ± 3,7
Control group		22	7	31,8 ± 2,2

As the Table demonstrates, a diagnosis of acute or chronic laryngitis was made in 48 patient, acute and chronic pharyngitis in 10 patients. Seven of them had laryngopharyngitis. The performed investigation revealed increased amount of anti-HHV-6 Ig G in the blood serum of a great number of the patients (69,2% ± 3,7) when compared with the controls. This occurred more frequently in the patients with chronic laryngitis (64,5% ± 2,7) and less frequently in those with acute laryngitis (47,1% ± 2,1). All investigated patients with acute and chronic pharyngitis (10 patients) as well as laryngopharyngitis (7 patients) had blood serum anti-HHV-6 Ig G. These findings prove high infection level with HHV-6 in the investigated patients with infectious inflammatory diseases of the larynx and pharynx. One third of the healthy subjects (31,8 % ± 2,2) also had anti-HHV-6 Ig G. Blood concentration of specific antibodies in all persons with anti-HHV-6 Ig G (patients with otorhinolaryngologic pathology and the controls) proved to be low and did not exceeded the findings in the controls. The patients with blood anti-HHV-6 Ig G did not have any clinical manifestations of a herpesvirus diseases. Simultaneous increase of blood specific Ig G to HHV-6 and HSV in 45,3% of cases is significant. OD parameters in 38,0 % were higher for HHV-6 then for HSV. In 30,0 % they were lower than for herpes simplex virus (HSV). In 32,0 % of cases OD indices were almost equal for the both herpesviruses.

This fact can be obviously explained by antigenic relation of herpesviruses of the same family (Herpesviridae). Development and application of more specific and sensitive diagnostic techniques will allow to confirm or disprove this hypothesis. Simultaneous discovery of serological markers of herpes simplex virus 1 and 2, herpes Zoster and HHV-6 in patients with dermatovenereal diseases was described earlier in 14 and 15.

#### Conclusion

1. High level of infection (69,2% ± 3,7) with HHV-6 was determined in patients with the diseases of the

pharynx and larynx. The frequency of revealing anti-HHV-6 Ig G in patients with acute laryngitis was 47,1%. This was significantly higher (64,5% ± 2,7) in patients with chronic laryngitis. Specific antibodies Ig G to HHV-6 were discovered in all 17 patients with clinical diagnosis of acute and chronic pharyngitis and laryngopharyngitis. Neither of the patients with blood Ig G to HHV-6 had clinical manifestations of herpesvirus infection.

2. Simultaneous immunoenzyme determining Ig G to HHV-6 and HSV revealed increased amount of them in 38,0% of cases with otorhinolaryngologic diseases.

3. Further investigation is necessary to work out the methods of diagnosis of acute HHV-6 infection, differentiation of the diseases caused by variants A and B of the virus as well as determining their role in development of various pathology. Extremely important is to determine the groups of high risk of HHV-6-associated diseases development with the consideration of the virus neurotropism and possible CNS complications.

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High level of infection with type 6 human herpesvirus (69,2%) was established in patients with infectious inflammatory diseases of the pharynx and larynx. Increased level of Ig G antibodies simultaneously to HSV and HHV-6 was determined in 38,0 % of cases.

**Key words:** herpes simplex virus, human herpesvirus type 6, laryngitis, pharyngitis, infectious.

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**ВИРУС ГЕРПЕСА ЧЕЛОВЕКА 6-ГО ТИПА И**  
**УРОВЕНЬ ИНФИЦИРОВАННОСТИ БОЛЬНЫХ**  
**С ЗАБОЛЕВАНИЯМИ ГОРТАНИ И ГЛОТКИ**  
**Панченко Л.А., Попова Н.Г., Торьяник И.И.,**  
**Казмирчук В.В.**

У больных с инфекционно-воспалительными заболеваниями гортани и глотки установлена высокая инфицированность (69,2 %) герпесвирусом человека 6-го типа. Повышенный уровень антител класса Ig G одновременно к HSV и HHV-6 определен в 38,0 % обследованных случаев заболеваний.

**Ключевые слова:** вирус простого герпеса, герпесвирус человека 6-го типа, ларингиты, фарингиты, инфекционный.

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**ВИРУС ГЕРПЕСУ ЛЮДИНИ 6-ГО ТИПУ ТА**  
**РІВЕНЬ ІНФІКОВАНОСТІ ХВОРИХ З**  
**ЗАХВОРЮВАННЯМИ ГОРТАНІ ТА ГЛОТКИ**  
**Панченко Л.О., Попова Н.Г., Торьяник І.І.,**  
**Казмірчук В.В.**

У хворих з інфекційно-запальними захворюваннями гортані та глотки встановлена висока інфікованість (69,2 %) герпесвірусом людини 6-го типу. Підвищений рівень антитіл Ig G одночасно до HSV та HHV-6 визначено у 38,0 % обстежених випадків захворювання.

**Ключові слова:** вірус простого герпесу, герпесвірус людини 6-го типу, ларингіти, фарингіти, інфекційний.