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**DETECTABILITY OF HEPATITIS B AND C MARKERS IN VILIUISK  
ENCEPHALOMYELITIS AND DYSCIRCULATORY ENCEPHALOPATHY PATIENTS**

**Summary.** Markers of hepatitis B and C have been revealed in Viliuisk encephalomyelitis (VE) and dyscirculatory encephalopathy (DE) patients. Anti-HB-cor has been more frequently found in VE and DE patients than in control group. Marker of hepatitis C (a-HCV) has been more frequently found in VE patients than in DE patients and control group.

**Key words:** markers of hepatitis, Viliuisk encephalomyelitis, dyscirculatory encephalopathy.

During studying of ethiology, epidemiology and clinics of Viliuisk encephalomyelitis (VE) proofs of existence of exogenous environmental factor have been received that gives the basis to refer VE to polyfactorial diseases. The analysis of sequence of VE occurrence in families and settlements of the central Yakutia supports the assumption of the role of some virus agent in transfer of disease [1].

The establishment of the fact of HCV-infection replication outside of a liver (in tissues of lymphoid and not lymphoid origins) allows to give up the idea of hepatocytes as the only place of duplication of a virus that helped, in particular, to understand pathogenesis of polysystemic lesions at HBV and HCV - infections and to consider viral hepatitis not only as infectious disease of a liver but also as systemic generalized viral infection that complicates duly diagnostics and treatment of chronic hepatitis. As the hepatitis B (HBV) has affinity to various tissues it more often affects a liver, however, DNA and proteins of the virus are also found out in kidneys, spleen, pancreas, skin, bone marrow mononuclear cells of peripheral blood, etc. [2]. The latest Canadian research showed that in 13% of people suffering chronic hepatitis C that made 300,000 of inhabitants of Canada, problems with health of neurologic character were also observed. Other research revealed that the virus of hepatitis C is capable to break blood barrier of

a brain. Chris Power, the doctor of Research Faculty of the Canadian University and his team of scientists decided to prove this theory in practice by carrying out some experiments with human corpses.

«The virus was found in the brain of the died patient who during lifetime suffered hepatitis C» - said Dr. Power who also noted that in normal conditions of an organism it is very difficult to any type of virus or infection to cross blood barrier of a brain. On the basis of this discovery the researchers made three new and basic statements. Firstly, the virus of hepatitis C injures those neurons in a brain which are responsible for movement functions, memory and concentration of attention of a person. Secondly, the virus is capable to initiate inflammatory process in a brain which promotes damage of a great number of neurons. And, thirdly, the virus interferes with realization of natural process in brain cells known as autophagy in which cells themselves get rid of undesirable toxic proteins. So, the injured cells of a brain accumulate a plenty of these toxic proteins causing development of brain disorders. «In medical practice have been already known for a long time the cases when patients infected by hepatitis had memory disorders and weak concentration of attention that very much complicated their diagnosis» - Dr. Power informed. Now there is some understanding of the reason of these neurologic symptoms that will essentially help to develop future methods of treatment of people suffering hepatitis. This is very significant discovery as for the first time it is proved in practice that virus of hepatitis can infect and injure brain cells [3].

**The purpose of research is:** to reveal markers of virus of hepatitis B and C in Viliuisk encephalomyelitis (VE) patients and in patients with dyscirculatory encephalopathy (DE) passed hospitalization in FSSE «Institute of Health».

**Material and methods:** During 2005-2010 from 139 in-patients markers of hepatitis B and C were surveyed in 127 (91.4%) of them. Average median age of the investigated people was 45 years (25-th and 75-th percentiles – 32.3 and 52.8 accordingly). The age range of the investigated people was within the limits of 17 - 79 years (Fig.1). In sexual structure women (63.9 %) prevailed, men made 36.1 %. Average median age did not statistically significantly differ according to sex (46 - in women, 42 - in men;  $p=0.36$ ) (Fig.2). The share of VE patients made 24.4 %; the other 75.6 % were DE patients. Average median age did not depend on the diagnosis and made 46 years in VE patients; 44.5 years – in DE patients ( $p = 0.11$ ) (Fig.3). Serologic research was carried out in immunologic laboratory of FSSE «Institute of Health» (ФСБОК 10834-01/06). Using test systems of SPU «Vector-Best» were revealed: markers of hepatitis B - HBsAg, antiHBc IgG, according to clinical indications - antiHBcor IgM, HBeAg, antiHBs; hepatitis D - anti-HDV in HBsAg-positive; hepatitis C - anti-HCV. The control group

consisted of samples of rural population of the Republic of Sakha (Yakutia) in quantity of 9167 persons. Statistical processing of results was made using the program MedCalc.

**Results and discussion:** frequency of HBsAg detection in investigated groups did not statistically significantly differ (14.7 % in VE patients; 4.5 – in DE patients and 5.7 - in control group). Marker Anti-HB-cor was more often found in VE and DE patients than in control group (81.8 and 60.9 % accordingly against 15.9). The marker of virus of hepatitis C (a-HCV) was more often revealed in VE patients than in DE patients and control group (17.6 % against 2.6 and 2.3 accordingly) (Table).

Epidemiological anamneses from the case records of VE and DE patients were also studied. In 19 patients (48.7 %) there were many parenteral interventions (those being often/long ill, receiving stationary and out-patient treatment, operative interventions, etc.); 4 (10.2 %) patients marked family contact to patients with chronic hepatitis B. In 16 (41 %) cases the risk factor of infection was not established within epidemiologically significant period.

**Conclusions:** Thus, the obtained data allow to assume that parenteral viral hepatitis B and C are opportunistic or contaminating infection in VE and DE cases. The further studying of the given problem will allow to clear up true influence of parenteral viral hepatitis on patients with neurodegenerative pathology.

Fig.1 Average age of VE and DE patients

Fig.2 Average age of patients according to sex

Fig.3 Average age of patients according to diagnosis

Table

Detectability of hepatitis B and C markers in the investigated groups of patients

		VE		DE		Control group	
		abs.	%	abs.	%	abs.	%
HBs-Ag	Positive	5	14.7	4	4.5	524	5.7
	negative	29	85.3	84	95.5	8643	94.3
a-HBcor	Positive	18	81.8	42	60.9	163	15.9
	negative	4	18.2	27	39.1	857	84.1
a-HCV	Positive	6	17.6	2	2.6	92	2.3
	negative	28	82.4	76	97.4	4000	97.7

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### **Mineral nitrogen compounds in the environment of Yakutia and the risk of endemic diseases**

In view of the toxicological role of nitrogen, the distribution of its mineral compounds in the environment of Yakutia is examined. The distribution of nitrogen compounds – nitrates, nitrites and ammonium – was studied in various components of the Yakutia's environment, including the atmosphere, snow cover, surface water and groundwater. Data are presented on the atmospheric deposition fluxes of nitrogen to the landscapes. The need for control of human exposure to nitrogen compounds is substantiated.

*Keywords: Environment, nitrogen, mineral compounds, toxicants, health effects*

#### **Introduction**

Nitrogen is an ecologically and vitally important, but strongly toxic element. N is the only chemical element which is a constituent of all amino acids, proteins, nucleic acids, enzymes and vitamins (Zbarsky et al., 1972) and thus is essential for all living organisms, ranging from viruses and microorganisms to higher organisms such as animals and humans.

Accumulation of nitrogen compounds in the landscape components had long been conceived only as an indirect indicator of domestic pollution. The attitude to the problem of elevated concentrations of nitrogen, especially nitrates, changed radically when their toxicological role was established.