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Features of the epidemic process of viral hepatitis B in the Altai region in prior to the vaccination and during the immunization

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Hepatitis B – a global problem of public health services in the world.

For the purpose of studying of development of epidemic process of sharp virus hepatitis B the analysis of dynamics of indicators of disease by the given infection in Altay territory during the period with 1986 for 2009 is carried out

As a result of the spent analysis it is revealed: decrease in disease by an acute hepatitis B in 2009 to a maximum level 1996; presence of return statistically significant correlation dependence between disease of the population of an acute hepatitis B and coverage by preventive inoculations against the given disease, with more expressed dependence among adult population till 55 years; presence of return statistically significant correlation dependence between disease of an acute hepatitis B and coverage by preventive inoculations of children till 17 years; change of age structure of ill children till 17 years towards decrease B relative density of children of

preschool age and increase B a share of children of school age; excess of an indicator of disease by an acute hepatitis B among city dwellers in relation to agricultural population at equal coverage by preventive inoculations of townsmen and villages.

Keywords: acute hepatitis B, epidemiological features, vaccination.

Introduction. Approximately 350-400 million people worldwide are infected with hepatitis B, despite the availability of vaccines. Hepatitis B infection has a 100-fold greater than the degree of infection with human immunodeficiency virus (HIV). Hepatitis B is in tenth place among the most common causes of death worldwide [1, 2, 3].

Materials and methods. The subject of the research were the main patterns of development of the epidemic process of acute viral hepatitis B taking into account the ongoing immunization against the disease in the Altai region.

A retrospective analysis of the incidence of acute hepatitis B was done. The total number of observations for patients with hepatitis B in the Altai Territory - 15 252, including cases of acute form - 13 615.

The basis of methods for studying patterns of development of the epidemic process of acute hepatitis B incidence of this infection control is comprehensive epidemiological study using statistical and laboratory methods.

In the process of study online and retrospective analysis of medical-demographic indicators, levels and dynamics of long-term morbidity, region's population vaccination against hepatitis B was carried out.

The research materials were subjected to statistical analysis using parametric and nonparametric tests. Statistical analysis was performed using the package STATISTICA-6 and features MS Excel. Checking normality test was conducted using the Shapiro-Wilke. Mean sample values of quantitative traits are given in the text as $M \pm m$, where M - mean sample, m - standard error of the mean. To identify statistical relations we used the method of correlation-regression analysis. Comparison of frequencies studied traits were performed using the statistical criterion χ^2 . The critical level of significance when testing the null hypothesis was assumed to be 0.05. To assess the statistical significance of differences between samples portions, the method of angular transformation of Fisher (L. Sachs, 1976). In all procedures, statistical analysis of the critical level of significance was taken as p 0.05.

Results and discussion. In order to study the development of the epidemic process of acute viral hepatitis B an analysis of the dynamics of the incidence of this infection in the Altai region in the period from 1986 to 2009. The data are presented (Fig. 1).

From these data it is clear that the development of the epidemic process of viral hepatitis B in the Altai region in 24 years we can distinguish several periods, each of which accounted for 5-6 years. The first - from 1986 to 1991, Characterized by a general tendency to reduce the incidence rate of attrition for the period amounted to 33% (average - 6.6% per year). Thus, the incidence has decreased from $18,2 \pm 0,26$ per 100 thousand population in 1986 to $12,2 \pm 0,67$ in 1991 ($p < 0,05$).

Second period - from 1992 to 1996, Characterized by rapid growth of incidence of acute hepatitis B. In comparison with the 1991 level (a measure of per 100 thousand population - $12,2 \pm 0,67$) in the five-year period 1992-1996. Incidence increased to 4.37 times the maximum level $53,4 \pm 1,41$ per 100 thousand population in 1996 ($p < 0,00001$) (growth rate - 337%, averaging 67.5% per year). The maximum increase was registered in 1995, when the incidence increased in comparison with the previous year by 2.1 times (annual growth rate was 112%).

During the subsequent five-year period (1997-2001 gg.) Incidence varies in different directions with a general tendency to reduce it. Until 2000, the recorded decline in incidence (for 1997-2000. 35%, the average rate of decline was 8.8% per year), and in 2001 - an increase of 6.6%. As a result, the incidence in 2001 decreased relative to the 1996 level of 31% from $53,4 \pm 1,41$ to $36,9 \pm 1,18$ per 100 thousand population ($p < 0,01$).

Later, in 2002, the dynamics of incidence of acute hepatitis B had an unswerving tendency to decrease and was characterized by high rates of attrition. So in 2002 the incidence rate decreased by 1.9 times to the level of 19.7 per 100 thousand population, the rate of decline was 46% in 2003 - 1.4 times to 13.60 / 0000 (30% decrease), in 2004 - the incidence has decreased by another 21% to 10.80 / 0000 (which is below the minimum value of the previous 16 years - $12,2 \pm 0,67$ in 1991). In 2009, the incidence was 3.40 / 0000, which is below the 2001 level - $36,9 \pm 1,18$ - to 11-fold ($p < 0,00001$). In general, for the period 2002-2009 incidence decreased by 91%, the average rate of decline was 11.4% per year.

Despite the positive trends in the incidence of acute hepatitis B in the Altai Territory, the rate of loss still lagged behind the nationwide figures. In 2002, the incidence rate in the region corresponded to the average for the Russian Federation - 19.70 / 0000, and since 2005 has significantly exceeded the national average.

During the period 2002-2008 in the Altai region, cases of acute hepatitis B decreased by 64.5%, while in the whole of the Russian Federation over the same period - up to 80%. So in 2005, the incidence in the Altai region was 28% higher than the national average ($11,0 \pm 0,65$ and $8,6 \pm 0,08$ per 100 thousand population, respectively, $p < 0,01$), in 2006 - on 34,3% ($9,4 \pm$

0,61 and $7,0 \pm 0,07$ per 100 thousand population, respectively, $p < 0,01$), in 2007 - the difference was 73,6% ($9,2 \pm 0,6$ in the province, $5,3 \pm 0,06$ for Russia to 100 thousand population, $p < 0,001$), and in 2008 already 75% ($7,0 \pm 0,53$ and $4,0 \pm 0,05$ 100 thousand population, respectively, $p < 0,001$).

In reducing the incidence of hepatitis B in the Russian Federation has played a significant role timely immunization of the population, including within the framework of priority national projects in health care. In the Altai region because of lack of coverage of population reduction in the incidence occurred more slowly.

Throughout the period of morbidity among the adult population significantly higher than the figure in a cohort of children under 17 years (Fig. 2). The maximum level for the period was registered in 1996 - $64,4 \pm 1,840 / 0000$ for adults and $14,28 \pm 1,780 / 0000$ in children under 17 years (rate per 100 thousand). Between 1997 and 2000 the incidence of adults decreased by 1.5 times (from $64,4 \pm 1,84$ up to $41,9 \pm 1,480 / 0000$, $p < 0,01$), children - in 4.2 times (from $14,28 \pm 1,28$ to $3,42 \pm 0,870 / 0000$, $p < 0,01$). In 2001, the incidence rate was $43,8 \pm 1,25$ for adults and $5,65 \pm 1,12$ for children under 17 years per 100 thousand ($p < 0,000101$).

During the study period the incidence structure has changed in the direction of reducing the proportion of preschool-age children and increase the proportion of school-age children (in the direction of increasing age of the children suffer from acute hepatitis B). This is directly related to the organization of immunization against hepatitis B, these age contingents: implementation of the national immunization schedule - the children of the first year since 2001, implementation of the national project - children under 17 years old, who did not ill and not vaccinated earlier, in 2006.

The incidence of acute hepatitis in urban population during the study period significantly exceeded the incidence of rural population in the period average of 3.2 times. Coverage of preventive vaccination in urban and rural population in 2007-2009. was almost the same level. Immunization against hepatitis B in the Altai Territory began in 1999 as a realization of the "school-based programs." Mass immunization of infants was introduced in 2001, since 2006 implemented national project "Health" segment on "Additional immunization of the population" - a mass vaccination of all persons under the age of 55.

Correlation analysis (Fig. 3) revealed a statistically significant inverse correlation between the incidence of people with acute hepatitis B coverage and preventive vaccination against the disease ($r = -0,65$, $p < 0,05$) with a more pronounced dependence in the adult population to 55 years found an inverse strong correlation between these parameters ($r = -0,92$, $p < 0,05$).

In general, for the period 2005-2009 coverage of hepatitis B adult population up to 55

years increased 10.9 times from 7.6% to 82.5% in the incidence of adults with acute hepatitis during the same period decreased by 3.4 times from $13,5 \pm 0,65$ to $4,0 \pm 0,37$ per 100 thousand population ($p < 0,0001$).

Correlation analysis also revealed an inverse statistically significant correlation between the incidence of acute hepatitis B and coverage of preventive vaccinations of children under 17 years ($r = -0,60$, $p < 0,05$).

Conclusions.

As a result of a retrospective analysis of hepatitis B in the Altai region for 1986-2009 years revealed the following:

- decrease incidence of acute hepatitis B in 2009 to the maximum level of 1996 by 16 times (94%) with an increase in the rate of decline since 2002;
- an inverse statistically significant correlation between the incidence of people with acute hepatitis B coverage and preventive vaccination against the disease ($r = -0,65$, $p < 0,05$) with a more pronounced dependence in the adult population up to 55 years found an inverse strong correlation between indicators ($r = -0,92$, $p < 0,05$);
- an inverse statistically significant correlation between the incidence of acute hepatitis B and coverage of preventive vaccinations of children under 17 years of age ($r = -0,60$, $p < 0,05$) with the strongest correlation in the age groups 3-6 ($r = -0,88$, $p < 0,01$) and 7-14 ($r = -0,64$, $p < 0,05$) years.

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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