COMMON AND CEREBROSPINAL IMMUNITY IN PANTROPIC VIRUS INFECTIONS

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We are offering and developing a hypothesis on common and transbarrier (hystohematogenous barriers) cerebrospinal immunity in pantropic virus infections. Common humoral and cellular immunity does not make improbable the penetration of virulent neurotropic viruses, such as tick-borne encephalitis pathogen, through hematoencephalitic barrier and the development of acute virus infection or virus persistence with the formation of chronic or slow infection process. Makers of specific antivirus vaccines should take this possibility into account.

Background

There is proof of pantropic character of tick-borne encephalitis (TBE) reproduction as well as similar diseases in inner organs and central nerve system (CNS) (1, 2).

The experience in vaccine prophylaxis against the diseases, caused by these viruses, testifies on high epidemic efficiency of TBE inactivated cultural vaccine, especially in western hotbeds of infection circulation area (3-7). Nevertheless vaccinated subjects show TBE slight clinical course, which is the evidence of virus penetration into CNS organs through hematoencephalitic barrier. We revealed chronic slow course TBE in some vaccinated subjects after aparalytic TBE or being healthy in half a year, a year or more after TBE inoculation. Poliomyelitic form, Kojewnikoff's (cortical) epilepsy, amyotrophic lateral sclerosis syndrome are among these forms (2, 8-9).

We are offering and developing the conception of common, barrier (hystohematogenous barriers) and transbarrier (cerebrospinal) specific immunity in pantropic virus infections (10, 11). Common immunity is being formed under natural immunization or vaccination apart from CNS up to hystohematogenous (hematoencephalitic) barrier, but this does not protect target-organs. Cerebrospinal immunity starts to develop only after virus or virus antigen penetration into CNS organs and tissues.

The efficiency of TBE specific prophylaxis is based on the following: antigen and immune gen activity of specific antivirus vaccines; the ability of wild virus population to penetrate into CNS organs from introduction point; the intensity of reproduction in extraneural system; penetration through hematoencephalitic barrier; tropism to nerve tissue (12,13).

Materials and methods

In our tests we used BALB/C white mice weighing 8 to 10 gram from Rapolovo nursery (Leningradskaya oblast), adult Macacus rhesus, delivered by plane from India, who were in quarantine and passed adaptation in vivarium of virology laboratory for at least 30 days. Virus indication and titration was produced on mice in intracerebral infection. We used TBE highly virulent strains (Sofyin, Pan and Absettarov) and naturally slowed Elantzev strain (15 - 20/ 3 clone).

Immunization was performed by inactivated vaccine (producer – M.P.Chumakov Poliomyelitis and Virus Encephalitis Institute of Russian Academy of Medical Sciences) and/ or naturally slowed Elantzev strain (15 - 20/ 3 clone), were inoculated in 4.0 - 4.4 lg LD_{50} concentration to macaques hypodermically or