

It was necessary to use a high concentration of plant vaccine strains of HSV-I and II types when creating an innovative form of herpetic vaccine. We received a high yield of the virus when growing viruses on a cell culture of human origin, in particular, in the CC FLECH. It was found that the reproductive activity of vaccine strains on the FLECH was 6.0–6.5 lg TCD 50/ml. It was higher in 10–100 times than the activity of their reproduction on the FECH QC for HSV strains I and II type, respectively. The specific activity of semi-prepared foods prepared in different cell cultures was studied in animals. It was found that the specific activity of semifinished products manufactured on the CC FLECH exceeded by 10 times the activity of the semifinished products obtained at the FECH QC, which was determined by the index of neutralization of the sera of immune animals.

Conditions for increasing the reproductive activity of HSV seed strains have been developed, the concentration of viral antigens in the vaccine has been increased 10–100 times, using a substrate of diploid cell culture of human origin, compared with CC FECH. Methods for the production of herpetic vaccine have been improved, and the basis for the creation of a new innovative form of herpetic vaccine has been developed.

3.43 doi: 10.15789/2220-7619-2018-4-3.43

IMMUNIZATION WITH UNIVERSAL INFLUENZA VACCINE ENHANCES IMMUNE RESPONSE TO SUBSEQUENT INFECTION

M.A. Shuklina, L.A. Stepanova, I.G. Vidyayeva, A.V. Korotkov, E.I. Eletskaia, L.M. Tsybalova

Smorodintsev Research Institute of Influenza, St. Petersburg, Russia

This study evaluated the cellular and humoral responses, relative to conserved viral M2 and HA antigens, of previously immunized mice to sublethal influenza infection. We developed an experimental, recombinant protein universal vaccine Flg-HA2-4M2e features a hemagglutinin second subunit (aa76–130) consensus fragment of influenza A viruses belonging to phylogenetic group 2 (HA2) joined with 4 tandem copies of M2e (viral M2 protein ectodomain); those fragments were sequentially linked to the C-terminus of flagellin. BALB/c mice were immunized intranasally 3 times (2 wk intervals, 10 µg/0.02ml); controls were administered PBS, as above. Two weeks after final immunization, immunized and control mice were challenged with a sublethal dose (100MID) of influenza A/Aichi/2/68 (H3N2). Post-vaccination humoral immune response was characterized by high levels (serum, BAL) of anti-M2e IgG and IgA. One month post challenge, anti-M2e IgG levels in immunized mice were elevated 1.5 fold. In controls, infection did not lead to anti-M2e IgG formation in serum. Anti-M2e IgA in BAL was increased 3.5 fold in immunized mice and only 1.7 fold in controls. A significant rise in IgG titers against A/H3N2 virus in immunized mice (5.6 fold) compared to controls (2.5 fold) was noted. In lung, the post-vaccination response was characterized by the formation of M2e- and HA2 specific T-cells (CD4⁺, single (TNF⁺) and double (TNF⁺IL2⁺) producing effector memory cells — Tem). One month after challenge, TNF⁺ and TNF⁺IL2⁺ M2e-specific T-em levels increased almost 10-fold. Double producers (IFN⁺TNF⁺) and triple producers (IFN⁺TNF⁺IL2⁺) were also detected. The pool

of HA2-specific double producing Tem (TNF⁺IL-2⁺) increased significantly (~4x), and TNF⁺ mono and IFN⁺TNF⁺IL2⁺ triple producers appeared. In control mice, infection resulted in the formation of fewer specific Tem cells. The results show that sublethal infection in mice pre-immunized with Flg-HA2–4M2e: enhanced Ag-specific local and systemic humoral responses; increased Ag-specific Tem lung populations; and led to the appearance of new cytokine secreting effector T memory cells.

Supported by: Russian Science Foundation (Project No. 15-14-00043-II).

3.44 doi: 10.15789/2220-7619-2018-4-3.44

FEATURES OF POPULATION IMMUNITY AGAINST MEASLES AND RUBELLA VIRUSES. WHY DO ADULTS SUFFER?

M.A. Smerdova¹, A.P. Toptygina^{1,2}, M.A. Naumova¹, N.P. Vladimirova³, T.A. Mamaeva¹

¹G.N. Gabrichevsky Research Institute for Epidemiology and Microbiology, Moscow, Russia; ²Lomonosov Moscow State University, Moscow, Russia; ³Centre for Hygiene and Epidemiology in Moscow, Moscow, Russia

The main factor in the immunity of people to measles and rubella viruses is the presence in the blood of the protective level of specific antibodies. These antibodies appear both after disease, and after vaccination. The level of antibodies is maintained for many years by long-lived plasmacytes and memory B-cells. Repeated contact with the virus leads to the boost — an increase in the level of specific IgG. However, in the conditions of intensive vaccination of the population, the circulation of the wild virus is reduced and the probability of natural boosting vaccinated people with wild strains of viruses is reduced. According to the Russian vaccination calendar, vaccinations against measles and rubella viruses are given to children at 1 year and 6 years of age. At the same time, among the measles cases, a group of young adults 20–40 years old is singled out, which raises the question of the duration of postvaccinal immunity. Using “Vector Best” kits, the study of the anti-measles and anti-rubella immunity was conducted of age groups: up to 1 year, 1–2 years, 3–6 years, 7–14 years, 15–17 years, 18–30 years, 31–40 years, 41–50 years and 51–60 years on the territory of Moscow and the Moscow region for 2013 (the territory with an unfavorable epidemic situation). The serum from 654 randomly selected healthy individuals and 646 patients from the same region with a serologically confirmed measles infection were examined. A gradual increase in the percentage of people with protective levels of antibodies to rubella and measles viruses was found, reaching 81.3% for measles and more than 90% for rubella at the age of 7–14 years. At the same time, the percentage of those protected against rubella remained at an older age. While the most pronounced increase in the seronegative persons to measles virus (40% or more) in the 18 to 30-year-old age group was found, but in groups older than 40 years, the immunity reached 85–95%. A strong negative correlation was found between the incidence of measles and the level of tension of the population's anti-measles immunity ($r = -0.76$). Thus, an increase in the number of cases of sickness to 28% at the age of 18–30 years and a decrease to 2.9% in 51–60 years was provided by a decrease (up to 55%) and an increase (up to 95%) of persons with protective immunity, respectively.