Betaleukin influence on antigen-specific immune response in model experiments on immunizing animals with live plague vaccine

T.S. Ponomareva¹, P.N. Deryabin¹, B.V. Karalnik², T.G. Denisova², T.I. Tugambaev¹, B.B. Atshabar¹, S.B. Zakaryan¹, N.N. Melnikova¹

¹ M.Aykimbaev Kazakh Scientific Center for Quarantine and Zoonotic Diseases, Almaty, Republic of Kazakhstan;
² H.Zhumatov Scientific Hygiene and Epidemiology Center, Almaty, Republic of Kazakhstan

Aim of the study — to assess the influence of human recombinant interleukin 1β (betaleukin, BL) on immunogenic and protective efficacy of live plague vaccine in animal models. Experiments were conducted on rabbits immunized with live plague vaccine EV and guinea pigs immunized with the same vaccine followed by infection with a virulent strain of Y. pestis 231. BL influence on antigen-specific immune response was assessed to identify lymphocyte antigen receptors (LfR) binding Y. pestis F1 antigen by adhesion and homologous antibody titer in indirect hemagglutination. Effect of BL on the protective activity was assessed by the number of dead guinea-pigs in control and experiment groups. Rabbits immunized with EV vaccine with BL showed a quicker appearance and disappearance of LfR and a faster and a higher antibody response. This indicated that BL stimulated early phase of antigen-specific immune response, accelerated the appearance and disappearance of LfR and the antibody response (the effector phase). Combination of live plague vaccine and BL significantly increased protective efficacy of EV vaccine in model experiments on guinea pigs. The evidence suggests that the use of recombinant IL-1β in combination with EV vaccine can be used to improve its efficiency. (Cytokines and Inflammation. 2014. Vol. 13. № 1. P. 57–62.)

Key words: betaleukin, live plague vaccine, antigen-specific immune response, animal model experiments.