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Immunomodulation's influence on immunogenicity and protective activity of live plague vaccine in modeling animal studies

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Influence of polyoxidonium (PO) and recombinant interleurin-1 β (Betaleukin-BL) on immunogenic activity of live attenuated plague vaccine EV (APV) was studied on 12 rabbits, immunized with APV in a dose of 10^6 microbial cells. All animals were randomized into three groups. First four rabbits received PO co-administrated with vaccine (0.3 mg/kg of body weight) intravenously (IV) with 0.5 ml of saline solution (SS), second 4 rabbits received BL 0.5μg per one animal with 0.5 ml of SS, third four rabbits were controls that received 0.5 ml of SS only. Antibody specific response was assessed by the level of antibodies to F1 antigen *Y. pestis* and lymphocytes having receptors to this antigene (LpRF1). Application of both immunomodulators accelerated occurrence and disappearance of LpRF1, achievement of their maximum concentrations, reduced value of their maximum and general concentrations, as well as provided earlier occurrence of anti-F1 antibodies which is evidence that these preparations accelerate development of specific antigenetic response to APV at both early, and effector phase. Calculation of used immunization schemes efficiency integrated rate demonstrated better result for BL. Effect of PO and BL on APV protective activity was studied on guinea pigs (GP). The first group (64 GP) received APV (10^6 microbial cells) and PO (0.2 mg/kg of body weight), the second group (23 GP) received APV (10^6 microbial cells) with BL (0.5μg per animal). The control group (82 GP) wreceived APV only (10^6 microbial cells). At day 21 after immunization all animals have been infected with 200 DCI of virulent strains *Y. pestis* 231. Protective effect was assessed by quantity of the survived animals. In control group 52 animals died. The survived animals have been sacrificed at day 14 after contamination. Culture *Y. pestis* 231 was isolated from spleens of all dead animals and 10 out of 30 (33.3±8.6%) survived animals. In the first group six animals died, in the second group 4 animals died, which is less ($p<0.01$), than in the control group. Survived GP were sacrificed on the 14th day after contamination. Culture *Y. pestis* 231 in these groups were not detected from neither died nor survived animals. There was no significant difference in mortality between the first and the second group ($p>0.05$). Thus, co-administration of APV and immunomodulators (PO and BL) can significantly increase APV protective activity.

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