

عنوان مقاله:

Improvement of the inactivated SARS-CoV-2 vaccine potency through formulation in alum/naloxone adjuvant; Robust T cell and anti-RBD IgG responses

محل انتشار:

مجله علوم پایه پزشکی ایران، دوره 25، شماره 5 (سال: 1401)

تعداد صفحات اصل مقاله: 8

نویسندگان:

Melika Haghighi - *Advanced Therapy Medicinal Product (ATMP) Department, Breast Cancer Research Center, Motamed Cancer Institute, Academic Center for Education, Culture and Research (ACECR), Tehran, Iran*

Akbar Khorasani - *Department of FMD Vaccine Production, Razi Vaccine & Serum Research Institute, Agricultural Research, Education & Extension Organization (AREEO), Karaj, Iran*

Pegah Karimi - *Advanced Therapy Medicinal Product (ATMP) Department, Breast Cancer Research Center, Motamed Cancer Institute, Academic Center for Education, Culture and Research (ACECR), Tehran, Iran*

Mehdi Mahdavi - *Advanced Therapy Medicinal Product (ATMP) Department, Breast Cancer Research Center, Motamed Cancer Institute, Academic Center for Education, Culture and Research (ACECR), Tehran, Iran*

خلاصه مقاله:

Objective(s): SARS-CoV-2, emerging as a major threat to public health, has to be controlled through vaccination. Naloxone (NLX), an opioid receptor antagonist, demonstrated its adjuvant activity for microbial vaccines. In this study, inactivated SARS-CoV-2 was developed in the Alum/NLX adjuvant to increase the potency of the inactivated SARS-CoV-2 vaccine. Materials and Methods: BALB/c mice were immunized on days 0 and 14 with inactivated SARS-CoV-2-Alum, -Alum + NLX 3 mg/kg, -Alum + NLX 10 mg/kg, and -Freund adjuvant, as well as PBS. IFN- γ and IL-4 cytokines and Granzyme-B release were assessed with ELISA. In addition, specific total IgG, IgG1/IgG2a isotypes, and ratio as well as anti-RBD IgG responses were assessed with an optimized ELISA. Results: SARS-CoV-2-Alum-NLX10 group showed a significant increase in the IFN- γ cytokine response versus SARS-CoV-2-Alum, SARS-CoV-2-Alum-NLX3, and PBS groups. The SARS-CoV-2-Alum-NLX3 group exhibited a significant decrease in IL-4 cytokine versus SARS-CoV-2-Alum. The mice immunized with SARS-CoV-2-Alum-NLX10 showed a significant increase in CTL activity versus SARS-CoV-2-Alum and PBS. In addition, mice immunized with SARS-CoV-2-Alum-NLX3, SARS-CoV-2-Alum-NLX10 and SARS-CoV-2-Freund demonstrated an increase in IgG response, as compared with SARS-CoV-2-Alum and PBS group. Furthermore, all formulations of SARS-CoV-2 vaccines could induce both IgG1 and IgG2a isotypes. But, the IgG2a/IgG1 ratio in SARS-CoV-2-Freund and SARS-CoV-2-Alum-NLX10 revealed an increase as compared with that of the SARS-CoV-2-Alum group. Anti-RBD IgG response in the SARS-CoV-2-Alum-NLX10 group showed a significant increase as compared with the Alum-based vaccine. Conclusion: Formulation of inactivated SARS-CoV-2 virus in .NLX/alum adjuvant improved the potency of humoral and, especially, cellular responses

کلمات کلیدی:

Alum Adjuvant, Immune responses, Inactivated SARS-CoV-2 - virus, Naloxone, Vaccine formulation

