Evaluation of Adjuvant Effect of BCG along with E7d Vaccine for the Immunotherapy of TC1 Induced Cancer in Mice Model

Mohammad Hossein Yazdi

Tehran University of Medical Sciences, Tehran, Iran

Abstract:

Induction of cellular immune response in tumor bearing mice and decrease of suppressor factors may result in controlling and inhibition of tumor progression. In the present study, the role of BCG as an immune-adjuvant element in vaccine formulation has been investigated, after immunization with HPV17E7d vaccine using BCG bacteria as adjuvant in tumor bearing mice, the balance of inflammatory and anti-inflammatory cytokines was assessed. Tumor was established in C57BL/6 mice with transplantation method. Experimental C57BL/6 tumor bearing mice were vaccinated three times with 10 days intervals with E7d protein formulated in Alum and BCG vaccine adjuvants. One week after final immunization, serum samples were obtained from five mice in each group. Then the quantity of IL-4, INF-γ, TNF-α cytokines and total IgG Antibody were evaluated with commercial ELISA kits. Also, the level of IgG1 and IgG2a were measured. In addition, survival and volume of tumors were monitored during the study period.

Results showed that immunization with vaccine formulated in BCG as adjuvant increased INF-γ and its ratio to IL-4 besides IgG2a as an important antibody. Also, TNF-α and total Antibody level were significantly higher when compared to PBS control and E7d Alum vaccine groups. In addition, survival of vaccinated mice with BCG adjuvant showed longer lifespan and the tumor volume of mice in this group were significantely lower than others. Regarding to the present data it can be concluded that formulation of E7d vaccine in BCG Alum can shift the immune responses toward Th1 pattern and cause a better outcome in terms of tumor progress and survival rate. Further studies in this filed will warrant more benefits of this formulation.

Biography:

Mohammad Hossein Yazdi got his PhD in the field of Pharmaceutical Biotechnology by 2014 from Tehran University of Medical Sciences, School of Pharmacy. His PhD work was about cancer vaccine and immunotherapy. He is now working as Assistant Professor at Biotechnology Research Center and Recombinant Vaccine Research Center of Tehran University of Medical Sciences and pursues his interest in both vaccine and immunotherapy of cancer and infectious diseases. He has published more than 35 papers in reputed journals and has been serving as senior lecturer of advanced immunology and immunotherapy at Tehran University of Medical Sciences.

Publication of speakers:

1. Yazdi, Mohammad & Faramarzi, Mohammad & Nikfar, Shekoufeh & Falavarjani, Khalil & Abdollahi, Mohammad. (2015). Ranibizumab and aflibercept for the treatment of wet age-related macular degeneration. Expert Opinion on Biological Therapy. 10.1517/14712598.2015.1057565.

2. Khangholi, Shideh & Mahdavi, Mehdi & Yazdi, Mohammad & Shahverdi, Ahmad Reza. (2020). The Toxicity of Synthetic and Biogenic Selenium Nanoparticles on Human Brain Glioblastoma Cell Line: An in vitro Comparison. International Journal of Medical Toxicology and Forensic Medicine. 10. 26851. 10.32598/ijmtfm.v10i1.26851.

3. Sanaei, Marzieh & Seyatesh, Neda & Sepehrizadeh, Zargham & Mahdavi, Mehdi & Yazdi, Mohammad. (2019). Nanobodies in Human Infections: Prevention, Detection, and Treatment. Immunological Investigations. 1-22. 10.1080/08820139.2019.1688828.

Webinar on Medical and Pharmaceutical Sciences