Cytokine Assay (ILs 4, 10, 12, 17, 23, IFN-γ), $CD8^+$&$CD4^+$ in Pre Challenge Balb/c Mice Vaccinated by the *Leishmania major* New Vaccine

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Abstract

Objective: Leishmaniasis, a zoonotic protozoan disease is common in the south and Central America, Asia and Africa continents where phlebotomus mosquito species transmit the disease between susceptible species. The companion animals and wild species can act as reservoir and maintain the parasite in the environment. This parasite is seen as amastigote form in vertebrate animals and promastigote form in the insects. Leishmaniasis affects about 12 million people from 88 countries and creates a complex and unpleasant disease that is long lasting, hard to treat and sometimes a life threatening disease that is known as visceral leishmaniasis. For this reason, development of an effective and a safe vaccine that protects the susceptible species is necessary. According to our previous finding of the author related to the new formulated provisional vaccine, it seems that a complex humoral and cellular response followed by vaccination to be involved, which required further investigation.

Methods: In the present project, we had six vaccinated groups received either 100 or 200 microgram/0.1ml *L. major* cocktail antigen, each of them also received Leishmania + BCG (LB), Leishmania + Teucrium (LT), or Leishmania + BCG + Teucrium (LBT) groups, and also one control group was considered. After vaccination and booster dose, $CD4^+$ and $CD8^+$ T cells profile of the lymphoid tissues and serum levels of immune effector cytokines including ILs-4, 10, 12, 17, 23, IFN-gamma were evaluated and the findings were analyzed statistically.

Results: Considering the six vaccinated groups compared together and normal group : number and size of pulps, percent of spleen weight /mouse weight, interferon gamma with mean of white pulp size, $CD4^+$ with $CD3^+$,IL- 23 with IFN-γ have had significant differences. And also without considering two injection doses, and considering to three injection groups: IL-10, IL-23, IL-12, CD25+, $CD3^-$&$CD4^+$ have had significant differences which may indicate a satisfactory immune response to the new formulated *L. major* antigen as a provisional vaccine.

Evaluation of Serum Levels of IL-17 and Il-23 and Spleen White Pulp Changes of BALB/c Mice Following Administration of New Formulation of *Leishmania major* Antigen as Provisional Vaccine

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Abstract

Objective: Leishmaniasis is an infectious disease caused by various species of leishmanial parasites including *L.major* protozoan that is transmitted to humans by phlebotomus mosquito bites. The prevalence of this disease in the world including Iran is increasing in almost double every decade. It seems that the best solution is development of an effective vaccine to prevent the disease.

Method: The experiment was conducted using six groups of female BALB/c mice received 100 or 200 micrograms of cocktail antigen of *L.major* adjuvanted with *Teucrium polium* plant extract, BCG or both nominated as LB (leishmania Ag+BCG), LTopt(leishmania Ag+Teucrium) and LBT (leishmania Ag+BCG+Teucrium).The first three group and the second three group received 100 and 200 micrograms of the fortified cocktail Ag respectively .the group seven was received no Ag injection and kept as control group. To evaluate the immunological responses following vaccination, clinical parameters, spleen changes and serum levels of IL-17 and IL-23 were considered.

Results: Preliminary results of statistical analysis of the data related to the spleen parameters and serum cytokines levels indicated significant differences among vaccinated groups either received 100 micrograms or 200 micrograms of the fortified Ag or vaccinated groups compared to control group. The findings have been in the favor of the new formulated provisional vaccine as shown also in our previous experiments.