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Effect of Loaded Glycyrrhizin Acid on PLGA Nano-particle on Treatment of Allergic Asthma

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Aim: Asthma is considered a complex disease of the respiratory system that is characterized by bronchoconstriction, airway inflammation, cough, dyspnea, and wheezing. Allergic reactions are the main reason behind asthma which is known as an important health problem with a high rate of morbidity and mortality in patients with respiratory diseases. Liquorice, the root of Glycyrrhiza, is primarily effective for asthma which is widely used in herbal medicine. In the present study, we designed nano-particles that carry Glycyrrhizinic acid as the effective component of Liquorice.

Method: After Poly (D,L-lactide-co-glycolic acid) PLGA nanoparticle preparation and Glycyrrhizinic acid loading, the morphology of the nanoparticle, the electric charge distribution, and drug-releasing ability were studied. Then the effect of Glycyrrhizinic acid-PLGA on the animal model of allergic asthma was investigated. Glycyrrhizinic acid-nanoparticle had a mean±SD size of 350±50 nm. About 67% of the effective component was released after 10 h. The interleukin (IL)-4, IL-5, IL-13, and IL-25 levels and the Muc5ac mRNA expression were decreased in the Glycyrrhizinic acid-PLGA treated group. In addition, a significant decline was observed in goblet cell hyperplasia, mucus hyper-secretion, and eosinophilic inflammation around bronchi and vessels of the nano-drug treated group, compared with the asthmatic group.

Conclusion: We found that Glycyrrhizinic acid-PLGA nanoparticle had an anti-asthma effect which may be used as a new drug to cure asthma. It can prevent bronchial obstruction, breathlessness, and asthma attacks.

Keywords: Allergy and immunology; Asthma; Medicinal plants; Nanoparticles; Traditional medicine.

Biography

Dr. Seyyed Shamsadin Athari, MPH, Ph.D., is an Assistant Professor of Immunology, Department of Immunology, School of medicine, Zanjan University of Medical Sciences, Iran. He completed postdocs in allergy and asthma toxicology and, asthma management and controlling a network fellowship. He has published more than 30 books and 110 papers in international journals in immunology, allergy, and asthma.

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