Acta Chimica and Pharmaceutica Indica
ISSN: 2277-288X

Immunomodulatory effects of two silymarin isomers in a Balb/c mouse model of Allergic Asthma

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Abstract

Introduction and Objectives: Allergic asthma is a complex chronic disease of the respiratory system presenting with cough, dyspnea, wheezing and airway obstruction. More than 300 million people of all age spectrums suffer from asthma worldwide. Immunological and inflammatory processes are main contributors to asthma. Cytokines produced by T helper 2 lymphocytes play main roles in asthma development and progression. Silymarin, a therapeutic agent with anti-oxidative properties, is a main component of Silybium marinum. We herein aimed to com-pare the anti-inflammatory and anti-allergic effects of two silymarin isomers, isosilybin A and silydianin, in the treatment of allergic asthma.

Materials and Methods: After isolating and purifying isosilybin A and silydianin, Balb/c mouse model of allergic asthma was produced using ovalbumin injection. Seventy mice were categorized into five (1 normal and 4 asthmatic) groups (n = 14 per group). Mice in three of four asthmatic groups were treated with either isosilybin A, silydianin or budesonide. The 4th asthmatic group was used as positive control, with the non-asthmatic group serving as negative control. Airway hyperresponsiveness (AHR) and levels of IL-4, IL-5 and IL-13 in the BAL fluid were determined. Gene expressions of IL-4, IL-5, IL-13 and MUC5ac, as well as IgE serum level were also measured. Cellular composition of BAL fluid and lungs histopathology were finally investigated.

Results: Isosilybin A and silydianin reduced eosinophilic infiltration of lungs, IL-4 and IL-5 levelsin BAL fluid, IL-4 and IL-5 gene expressions, as well as AHR in Balb/c mouse model of asthma. However, no significant changes were observed in IL-13 level and mucus hyper-secretion.

Conclusion: According to our study, isosilybin A and silydianin can control main symptoms of asthma by modulating immune responses.

Biography

Seyyed Shamsadhin Athari is a professor in Immunology within the Zanjan University of Medical Sciences in Iran. His research is aimed at developing novel medicinal products which will have a huge impact on treating diseases with respect to various allergans. He has over 20 years' experience in the area of Immunology and has published extensively in peer-reviewed journals, conference abstracts and book chapters. His research group is focused on the design and development drugs and medicinal products against allergans.

Publications

- Targeting cell signaling in allergic asthma
- Critical role of Toll-like receptors in pathophysiology of allergic asthma
- Influence of probiotic and prebiotic on broiler chickens performance and immune status
- The importance of eosinophil, platelet and dendritic cell in asthma
- The global distribution of lymphatic filariasis, 2000–18: a geospatial analysis

Annual Conference on Applied Pharmacology and Toxicology | Webinar | July 09, 2021

Citation: Immunomodulatory effects of two silymarin isomers in a Balb/C mouse model of Allergic Asthma, Applied Pharmacology 2021, Annual Conference on Applied Pharmacology and Toxicology, Webinar, July 09, 2021