Kwan-Kyu Park, J Clin Exp Dermatol Res 2017, 8:4 (Suppl)
DOI: 10.4172/2155-9554-C1-060

Therapeutic effects of melittin on ovalbumin-induced atopic dermatitis mouse model

Kwan-Kyu Park
Catholic University of Daegu, South Korea

Background: Atopic dermatitis (AD) is one of inflammatory skin diseases that is characterized by intense pruritus and relapsable eczematous lesions. The hallmarks of AD are defects of epidermal barrier and immunoglobulin E (IgE)-mediated sensitization to several environmental allergens, and immune disorder mediated by an imbalance towards T-helper-2 (Th2) response. Melittin (Mel), a major component of Bee venom, has been studied in various inflammatory diseases including liver cirrhosis, atherosclerosis, and acne. However, beneficial effects of Mel on AD-like animal have not been explored. Therefore, we investigated the anti-atopic effects of Mel.

Methods: AD was induced on shaved back of BALB/c by using ovalbumin (OVA) patch. Mel was treated epicutaneously or intraperitoneally. After agent treatment, skin lesions and sera were extracted from sacrificed mice. Skin tissues were divided and used for H&E staining, Quantitative real-time PCR, and Western blot. Cytokines and IgE in the sera were determined by ELISA.

Results: OVA-induced skin thickening and inflammatory infiltration were decreased in Mel-treated group. Mel prevented OVA-induced filaggrin deficiency. Furthermore, Mel ameliorated OVA-induced imbalanced inflammatory mediators.

Conclusions: This study has shown that Mel inhibits OVA-induced AD-like symptoms in mice. The OVA can contribute crucially to the AD-like cutaneous symptoms, such as skin thickening, mast cells infiltration, filaggrin deficiency, exaggerated serum-IgE, and increased inflammatory mediators. However, Mel ameliorated the OVA-induced AD-like cutaneous symptoms and inflammatory mediators leading to the progression of AD. Furthermore, this study may be the first evidence that Mel can be used for anti-inflammatory effects on OVA-induced AD. Therefore, it is suggested that Mel is regarded as an alternative therapeutic agent for AD.

Biography

Kwan-Kyu Park has completed his MD and PhD. He is now a Professor of Pathology, the Chief of the Pathology Laboratory in College of Medicine, Catholic University of Daegu, based in Daegu, Republic of Korea. He has published over 300 papers about various inflammatory diseases and pathology. He is an expert in Kidney and Liver Pathology and his main research interest is inflammatory diseases including dermatitis. He is also interested in therapeutic effects of bee venom and its component on various diseases. The papers he published about bee venom are over 30. Further, he studied about gene therapy using oligodeoxynucleotide decoy and siRNA. Currently, he leads a team of 8 members in Pathology Laboratory, and works as a Specialist for Daegu Catholic University Medical Center.

kkpark@cu.ac.kr

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