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Development and preclinical evaluation of a novel polyherbal product for treatment of Atopic dermatitis & other chronic dermal inflammatory diseases by multiparametric analysis

Eczema or atopic dermatitis (AD) is a common chronic or recurrent inflammatory pruritic skin disease with impaired skin barrier with itchy, red, swollen, and cracked skin. Skin lesions are characterized by infiltrating lymphocytes, monocytes/macrophages, eosinophils and over secretion of inflammatory cytokines/chemokines. Thymus and activation regulated chemokine (TARC) is overexpressed in eczema lesions and attracts Th2 cells. IgE and IgE-mediated mast cell, and eosinophil activation contribute to severity of eczema. Current management strategies include oral medications, steroid creams and light therapy. There is an unmet need for development of herbal based therapeutic agents with anti-AD potential. We have developed a novel aqueous mixture (SIRB-001) consisting of 3 traditional Chinese medicine (TCM) based herbs; *Rheum palmatum* L. (Da Huang), *Rehmannia glutinosa* Libosch (Sheng di huang) and *Lonicera Japonica* (Jin yin hua) in the ratio 1:1:3. SIRB-001 has previously demonstrated promising anti-psoriatic activity in pre-clinical and clinical studies. SIRB-001 led to inhibition of hyper-proliferation, induction of apoptosis in keratinocytes, inhibition of cytokines in keratinocytes and immune cells. SIRB-001 cream was developed and potential clinical efficacy was observed in psoriasis and scalp psoriasis. SIRB-001 was further tested for efficacy in eczema and AD using pre-clinical models. SIRB-001 demonstrated significant inhibitory effects on secretion of inflammatory cytokines, TNF- α , IFN- γ , IL-6 and chemokine TARC in keratinocytes (HaCaT). Vascular endothelial growth factor (VEGF) causes hyperpermeability of blood vessels and endothelial cell proliferation, leading to persisting erythema and edema in AD. Inhibition of VEGF secretion by HaCaT indicates anti-angiogenic role of SIRB-001. Downregulation of IL-6 in RAW264.7 cells and IgE in human myeloma cell line-U-266 were observed. Janus-Kinase (JAK) is involved in cell signaling pathways activated by cytokines. SIRB-001 exhibited an inhibition of JAK-1/JAK-3 *in vitro*. In conclusion, based on the observed mechanistic action, SIRB-001 may be a highly effective new treatment for management of atopic dermatitis and eczema.

Biography

Anu T Singh is the Vice President (R&D) at Dabur Research Foundation, India. She holds a PhD degree in Tumor Biology from All India Institute of Medical Science, Delhi and did her Post-doctoral research in Cell Signaling from National Institute of Immunology, Delhi. She has published and presented more than 60 research papers in peer reviewed journals and scientific meetings. She has extensive experience in the area of oncology, inflammation and dermatopathology.

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