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Soybean: a Potential Antipsoriasis Agent

Nader Pazyar [1,*]; Reza Yaghoobi [1]

[1]Department of Dermatology, Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, IR Iran

*Corresponding author: Nader Pazyar, Department of Dermatology, Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, P. O. Box: 173, Ahvaz, IR Iran. Tel: +98-9188617133, Fax: +98-6133743019, E-mail: dr.pazyar@gmail.com

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Psoriasis is a chronic hyperproliferative skin disease, which affects approximately 2% to 4% of the general population. This immune-mediated disorder is characterized by erythematous scaling plaques ranging extensively in size on the scalp, elbows, knee, and other surfaces of the skin (1). Importantly, genetic, immunohistochemical, and pharmacologic investigations support a prominent role for nuclear factor kappa B (NFκB) pathway in pathophysiology of psoriasis (2). Numerous dermatological evidences indicate that tumor necrosis factor (TNF)-α is the pivotal immune mediator involved in psoriasis pathogenesis. This inflammatory cytokine induces antiapoptotic proteins in psoriatic skin (3, 4). Interleukin (IL)-1β and IL-6 are unanimously believed to be important in psoriasis disease. Of note, genetic polymorphisms related to IL-6 genes have a relationship with psoriasis that could have a potential effect on disorder counseling and management (5). IL-8 is a chemotactic pro-inflammatory cytokine for all types of migratory immune cells. Recently, Qazi et al. demonstrated the elevated production of IL-8 and/or its receptors in patients with psoriasis (6). Some scientific documents suggest that tissue angiotensin converting enzyme (ACE) activity in involved skin is significantly increased in patients with psoriasis. Additionally, assessment of therapeutic efficacy in psoriasis is attributed to determination of tissue ACE activity as a good nonspecific parameter (7).

Soybean (Glycine max) has been known as a golden bean (8). It has been established that isoflavones are the most abundant phytoestrogens in soybean and structurally similar to 17 beta-estradiol (9). Genistein is considered as the main isoflavone in soybean and exerts potent anti-inflammatory (10) and anti-oxidant properties (11). Soybean and genistein substantially have been safely used at high levels in several Asian populations in many centuries and play a brilliant role in health promotion (12). Notably, it has been clarified that genistein exerts antiproliferative activity by inhibiting NFκB signaling (13). There is a great deal of immunological evidence that genistein modulates inflammatory responses by reducing production and expression of pro-inflammatory biomarkers such as TNF-α, IL-1β, IL-6 and IL-8 (14-16). Xu et al. investigated (in vivo and in vitro) the association between genistein and changes of ACE in the rat model. They reported down-regulation of ACE with a consequent change in circulating levels of angiotensin II (Ang II) (17). Human neutrophil elastase is a serine protease, which is present in its active form in inflamed tissue as well as psoriatic lesions. It has been identified that genistein could inhibit neutrophil elastase release (18). To conclude, given several lines of documents indicating that genistein suppresses pro-inflammatory cytokines such as NF-κB, TNF-α, IL-1β, IL-6, IL-8 as well as ACE, also its inhibitory effect on elastase release, it could be proposed that topical application of genistein might be a potential therapeutic strategy for psoriasis therapy.

Because of the safety of genistein (12), its topical use might be recommended as adjuvant together with corticosteroids in psoriasis management, especially while treating patients resistant to the treatment. Ito et al. (19) investigated topical application of Glyteer (GL) (soybean) on a psoriatic model in mice; they observed that GL inhibits epidermal weight and its protein amount on the hyperplastic response in mice. In addition, GL inhibited edema in mice and inhibitory action of GL on edema had the same potency as those of betamethasone 17-valerate, indomethacin and cyclosporine. According to these results, researchers suggested that soybean might have a potent therapeutic effect on psoriasis disease. This study supported our commentary on potential administration of soybean as a potential armamentarium against psoriasis.

Finally, topical genistein found to decrease psoralen-ultraviolet A (PUVA)-induced skin thickening and greatly reduce cutaneous erythema and ulceration dose-dependently (20). Accordingly, in patients with psoriasis combining genistein with PUVA therapy might potentiate the therapeutic response of latter and protect against its

complications. This paper should serve to encourage researchers to conduct clinical trials on this subject.

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