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ORIGINAL PAPER

Evaluation of serum levels of heat shock protein 70 in patients with psoriasis in Basra, Iraq

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Abstract

Introduction: Psoriasis is a chronic, non-infectious skin disease that affects people of all ages and has no sex preference, which is caused by environmental stressors involving skin cells, immunocytes, and several biologic signaling molecules. Psoriasis has been linked to psychological, metabolic, arthritic, and cardiovascular complications. Heat shock protein 70 (HSP70) is considered the most protective member of the HSP family. HSP70 can regulate protein homeostasis, minimize stress-induced denaturation and aggregation of intracellular proteins and operate as a protective factor in tissue damage. This study aimed to investigate the serum level of HSP70 in patients with psoriasis to assess whether there is an association of HSP70 with psoriasis and to assess the effects of age, gender, body mass index (BMI), waist circumference, and disease duration on the serum level of HSP70.

Material and methods: This was a case-control study which recruited 98 patients with psoriasis and 81 apparently healthy age- and sex-matched individuals as controls. Blood samples were collected via venipuncture (5 ml) to estimate the HSP70, random blood sugar, liver enzymes, lipid profile, and complete blood count.

Results: The results revealed that the level of HSP70 was significantly higher in psoriasis patients compared to the control group (p-value < 0.05). The level of HSP70 showed a significant association with gender, but a non-significant positive correlation with duration of psoriasis. The level of HSP70 showed a non-significant negative correlation with age, BMI and waist circumference.

Conclusions: The study suggested that HSP70 may have a potential role in the pathophysiology of psoriasis and may help to explain the mechanisms behind the development and treatment of psoriatic lesions with different severity.

Key words: psoriasis, heat shock protein 70, heat shock proteins.

Introduction

Psoriasis is a long-term skin condition that is not infectious and can develop in people of all ages and genders [1]. The prevalence of psoriasis can range 0–1.8% in various populations [2]. Although psoriasis can impact individuals across all age groups, it is more frequently observed in people who are under 29 years old [3]. Psoriasis is believed to be attributable to a combination of genetic, epigenetic, and environmental factors. These factors contribute to abnormal interactions between immune cells, cytokines (proteins involved in cell signaling), and skin cells, leading to the development of psoriasis [4]. Heat shock proteins (HSPs) are ubiquitous and well-described proteins, with sizes varying from 10 to over 100 kDa, and these molecules can be found in various cellular compartments [5]. Heat shock proteins are categorized into six primary families: HSP100, HSP90, HSP70, HSP60, HSP40 and small HSP. These classifications are based on factors such as their molecular weight, function, and structure [6]. Heat shock proteins have an important function in safeguarding cells against inflammation, apoptosis, and oxidative stress. They also assist in protein refolding and maintaining proteostasis during challenging circumstances [7].

Their functions have recently been improved to involve immune response modulation, cell signaling control [8], and other chronic diseases such as psoriasis [9]. Heat shock protein 70 (HSP70) is the most protective member of the HSP family [10]. HSP70 can reduce stress, stimulate denaturation and aggregation of intracellular proteins, work as a protective factor in tissue damage, play essential roles in dendritic cell activation and maturation, and reflect systemic inflammation and oxidative stress [11, 12]. The effect of HSP70 on keratinocytes may possibly result in a decrease in HSP70 production, which may be associated with an increase in susceptibility to heat-induced death of old keratinocytes [13].

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