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Study of thyroid hormones for psoriatic patients in AL-Anbar governorate

Wajeeh Y. Mohammed* **Abdullah S. Al-Hasan**** **Ausama A. Faisal .****

*University Of Anbar - College of science
** University Of Anbar - College of medicine, department of medicine

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ABSTRACT

Psoriasis is a chronic inflammatory skin condition which affects approximately 1-3% of the world's population[1]. It appears as a red plaques covered with silvery scale that flakes away from the skin. Psoriatic plaques are often found on the elbows, scalp and knees but can also affect other parts of the body such as the face, feet and mucous membranes.Psoriasis is not contagious, nor is it caused by an allergy. However, the tendency to develop the condition can be genetically transmitted. Psoriasis causes itching in 60% to 70% of cases[2]. However, the exact etiology of psoriasis is unknown. Abnormalities in thyroid hormones have been proposed. To evaluate the serum thyroid hormones in psoriatic patients of Al-Anbar governorate.: The study group included 60 patients with psoriasis, and 30 healthy volunteers. Blood thyroid hormones was determined using commercial kits from reliable Americans and germens companies by using ELISA apparatus. All patients had psoriasis involving less than 30% of body surface. Their ages ranged from 10 to 60 years with a mean of 32 years. Family history of psoriasis was positive in a percentage of (20%) of the patients. The mean levels of thyroid hormones (T3, T4) in patients with psoriasis were found to be significantly higher than those of healthy individuals, while the mean levels of TSH were found to be significantly lower than those of healthy individuals. This study strengthens the relationship between the thyroid gland disorders and the pathogenesis of psoriasis. Therefore we concluded that psoriatic patients should be evaluated for hyperthyroidism goiter. Administrating thyroid gland medicines for patients particularly cases with severe disease may be beneficial prognosis.

Introduction:

Psoriasis is a common disease affecting, as presumed, approximately 120–180 million people worldwide[3]**.** Around 150,000 new cases of psoriasis are reported annually. There are fewer reports on the incidence of psoriasis, but in recent studies an increasing trend over the last 3 decades was shown[3,4]. The population prevalence of psoriasis has been reported to range from 2% to 3%. However, in some countries there is a higher prevalence rate for psoriasis, for example in Kazakhstan, Trinidad and Tobago, Paraguay, Kenya, Tanzania, Egypt, and Kuwait[5]. Four hundred people die annually from psoriasis-related causes in the Unites States[3]. Psoriasis prevalence in the population is affected by genetic, environmental, viral, infectious, immunological, biochemical, endocrinological, and psychological (trauma, stress) factors as well as alcohol and drug abuse[6,7]. Lipid metabolism research studies in psoriasis have been started at the beginning of the 20th century from the quantitative analysis of serum cholesterol in psoriatic patients[8]. The abnormal fat metabolism was considered to be an important factor in the etiopathogenesis of psoriasis[3].

* Corresponding author at: University Of Anbar - College of science.E-mail address: dean_coll.science@uoanbar.edu.iq

Normal skin cells mature and replace dead skin every 28-30 days. Psoriasis causes skin cells to mature in less than a week. Because the body can't shed old skin as rapidly as new cells are rising to the surface, raised patches of dead skin develop on the arms, back, chest, elbows, legs, nails, folds between the buttocks, and scalp.

Psoriasis is considered mild if it affects less than 5% of the surface of the body; moderate, if 5-30% of the skin is involved, and severe, if the disease affects more than 30% of the body surface [(5)].

It was also suggested that continuous separation of psoriatic scales caused the permanent loss of lipids which might affect serum lipid abnormalities[(8,9)]. Certain endocrinological disturbances exacerbate the Disease[(10)].

An improvement in psoriasis was reported in a psoriatic with hyperthyroidism[(11)]. It was shown that two thyroid hormones, T3 and T4, cause an increase in Epidermal Growth Factor (EGF) which leads to epidermal hyperplasia[(12)]. In two different studies Safet et al reported that T3 stimulates the proliferation of keratinocytes[(13,14)]. Thyrotoxicosis is also classically associated with cutaneous manifestations. In a review of thyrotoxic presentations, hyperhydrosis, was the second most common finding[(15)]. Although certain manifestations are specific to Graves disease, thyrotoxicosis of any etiology can include skin sequelae.

Skin manifestations of thyroid dysfunction may be divided into three categories: (1) direct action of thyroid hormone on skin tissues, (2) skin manifestations of direct thyroid hormone action on non-skin tissues and (3) autoimmune skin disease associated with thyroid dysfunction of autoimmune etiology[(16)].

Materials and methods

Patients and Methods

A total 60 patient with psoriasis were enrolled. Half number of healthy individuals with matching ages were included as controls. The samples were collected from the patients during them visiting to dermatological clinic of Dr. Abdullah Salih Alhasan in Al- Anbar governorate. The ages of the patients ranging between 10-60 years old from both sexes. Many questions were asked to the patients about his name, age, accommodation, occupation, chronic diseases, family history, time of infection, the presence of psychological disturbances, smoking, most common diet, most common drinks, spiritual questions (prayer), time of disease exacerbation, and the factors that exacerbate psoriasis to avoid the interferences with the other diseases, and to find a cause for this disease. All of patients and healthy individuals were not smokers, have no any chronic diseases, and not alcoholic drinkers. After fasting of 14 hours, 12 ml of venous blood was drawn in sterile syringe and centrifuged to separate the serum and then stored at -45˚c until being used. The estimation of T3, T4, and TSH levels were done by using the ELISA apparatus and its special kit[(17)].

Results

The study included a total of 90 persons. Among them 60 had psoriasis (35 male and 25 female) and 30 were healthy controls (18 male and 12 female). Their ages ranged from 10 to 60 years with a mean of 32 years. All had psoriatic lesions that involved less than 30% of body surface. Family history of psoriasis was positive in a percentage of (20%) of the patients. The majority of patients (n= 60, 100%) had plaque type psoriasis**.** The duration of disease ranged between 1 month to 30 years with a mean of 6.9 years. History of seasonal variation of disease was positive in (58.3%) patients. Out of these (15%) noticed exacerbation of disease in winter while (43.3%) in summer season. Bad emotional state exacerbates of about (66.66%) of psoriatic patients, while the other (33.34%) does not affected. This study showed that there is no relationship between the occupation, accommodation, most common diet, most common drinks, and spiritual side and psoriasis. In the patient's group T3 and T4 were significantly higher than those in control group. While TSH was significantly lower than those of healthy individuals. The results are depicted in Table 1.

Table 1: Mean value, S.D, t-value, and p-value of the parameters were tested.

No.	parameters	factor	mean	Std. deviation	t- value	P-value
1	T3	patient	1.3	0.629	2.486	0.015
		control	0.97	0.521		
2	T4	patient	6.49	2.717	5.039	0.000

		control	3.93	0.737		
3	TSH	patient	2.69	1.24	-3.969	0.000
		control	4.3	2.62		

The values are reported as mean ± SD and 95% confidence interval. For statistical analysis between groups paired t test was used. Pearson test was used for correlation analysis. The levels of each marker were compared between the study groups and control group, using SPSS computer package. P values of < 0.05 were considered significant. The table above shows that total T3 and T4 are higher in patients in a comparison with controls in a significant difference (P<0.05). While TSH is lower than those in controls (P>0.05). Figure 1 and 2.

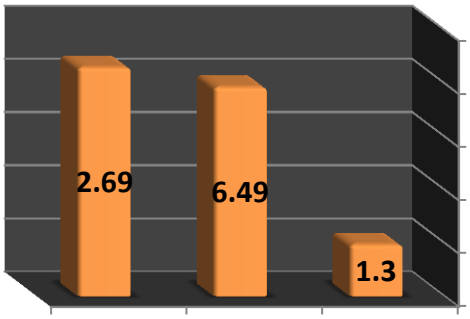

Figure 1: the mean values of patients parameters. 1- T3, 2- T4, 3- TSH.

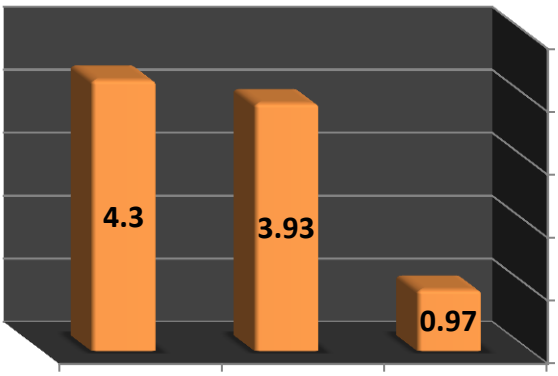

Figure 2: the mean values of controls parameters. 1- T3, 2- T4, 3- TSH.

DISCUSSION

Psoriasis is a common, chronic inflammatory skin disease characterized by a marked increase in keratinocyte proliferation, abnormal differentiation of keratinocytes, prominent alterations in dermal capillary vasculature and the presence of dermal and epidermal mononuclear leucocytes and neutrophils[18]. Several reported studies demonstrate an association of psoriasis with hyperthyroidism[19]. The present study demonstrated increased T3 and T4 serum levels in patients with psoriasis compared to controls. . An Indian study showed that the serum TT4 and FT3 levels were significantly higher in psoriatics than in the control group. The average PASI scores were significantly higher in these patients and this may be due to the direct or indirect effects of thyroid hormones on the course of psoriasis. Thus excessive production of thyroid hormones may aggravate psoriasis[20]. In spite of the fact that many developments are recorded in the treatment and pathogenesis of psoriasis, its etiology still remains obscure.

Propylthiouracil, an anti-thyroid preparation, was successfully used both in local(21) and systemic(22-24) treatment of psoriasis. Although the mechanism of action was unclear, it was suggested that this drug might have a regulatory effect on the T cells in the psoriasis plaque(23,24). Propylthiouracil increased the number of total and suppressor/cytotoxic T cells and reduced activated lymphocytes in psoriatic plaques(24). Other anti-thyroid agents, such as methimazole(25) and thiamazole(26), have also been used successfully in the treatment of psoriasis. This means that thyroid hormones may have unknown effects on the disease. It is postulated that T3 receptors may play a role in the synthesis of keratin(22). The existence of T3 receptors on the skin was also proved(27). Propylthiouracil, which is known to be an anti-thyroid drug, may affect the keratin synthesis process by binding to nuclear T3 receptors(28). It is also known that T3 has a major role in the regulation of cell growth and differentiation. Moreover, it has been stated that T3 and T4 have hyperproliferative effect on the skin(29,30). The skin may be a target organ for thyroid hormones and these hormones increase EGF (Epidermal Growth Factor) and therefore accelerate epidermal proliferation(13,31). The role of these hormones on the etiopathogenesis of psoriasis will become clearer when the effect of thyroid hormones on keratinocytes and the anti-proliferative effect of antithyroid drugs on psoriasis are better

demonstrated with experimental studies. Meanwhile, it may be useful to check the thyroid function in patients with uncontrolled and relapsing psoriasis.

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دراسة هرمونات الغدة الدرقية للمصابين بالصدفية في محافظة الانبار

وجيه يونس محمد عبد الله صالح حسن اسامة عباس فيصل

E.mail: dean_coll.science@uoanbar.edu.iq

الخلاصة:

الصدفية هي ألتهاب جلدي مزمن منتشر بنسبة 1-3% من سكان العالم، يظهر بشكل بقع حمراء مغطاة بطبقة من القشور الفضية التي تتقشر من الجلد. تظهر بقع الصدفية على عدة أجزاء من الجسم مثل المرفق، فروة الرأس، الركب، واماكن اخرى مثل الوجه، الاقدام، والاغشية المخاطية. الصدفية مرض غير معدي ولا يتسبب بواسطة الحساسية ولكن قابلية الاصابة بالصدفية يمكن ان تنتقل وراثيا. تسبب الصدفية حكة في مكان الاصابة بنسبة 60-70% من المصابين اما النسبة المتبقية فلا يعانون من حكة. السبب المرضي للصدفية غير معروف، ولكن لوحظ اضطراب بعض الهرمونات مثل هرمونات النمو وهرمونات الغدة الدرقية. هدفت الدراسة الى تقدير تراكيز هرمونات الغدة الدرقية عند المرضى المصابين بداء الصدفية في محافظة الانبار. تضمنت الدراسة 60 مريض و30 متبرع سليم. تم قياس تركيز هرمونات الغدة الدرقية لهم بأستخدام الكتات التجارية من شركات معتمدة امريكية وباستخدام جهاز الاليزا. اظهرت النتائج انسبة الاصابة بداء الصدفية لجميع المرضى كانت اقل من 30% من مساحة الجلد، وتتراوح اعمارهم بين (10-60) سنة وبمعدل 32 سنه. تاريخ العائلة مع الصدفية كان ايجابي بنسبة 20% من مجموع المرضى. تركيز هرموني الـ (T3 وT4) عند مرضى الصدفية كانت مرتفعه مقارنة مع الاشخاص الاصحاء، اما تركيز هرمون الـ (TSH) عند مرضى الصدفية كان اقل من تركيزه عند الاشخاص الاصحاء. هذه الدراسة تقوي العلاقة بين اضطرابات الغدة الدرقية مع سبب المرض. لذلك نستنتج ان مرضى الصدفية يكونون عرضة لارتفاع هرمونات الغدة الرقية والاصابة بمرض الدراق. استخدام الادوية المخصصة للغدة الدرقية للمرضى المصابين بداء الصدفية وخصوصا الحالات الشديدة يكون تتبع مفيد للمرض.