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THE RELATIONSHIP BETWEEN DIFFERENT PSORIASIS TYPES AND THYROID DYSFUNCTIONS

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ABSTRACT

Background: Psoriasis is considered a common inflammatory and proliferative condition of the skin. Association between psoriasis and thyroid disorders have been suggested, but the prevalence of disorders vary widely. **Aim:** The purpose of this study was to evaluate the levels of thyroid hormones in psoriasis patients, as well as the association of thyroid dysfunction with severity of disease and demographic characteristics of patients. **Patients and Methods:** This was an analytic study (case-control) involved 45 patients with a diagnosis of psoriasis referred to clinic of dermatology, Lattakia University Hospital during one-year period (2023-2024) who were compared with a group of healthy individuals regarding of thyroid gland function. **Results:** There were no significant differences between two groups regarding of age (p:0.7) and gender(p:0.5). Plaque psoriasis represented the most frequent type in 31 cases (68.9%) with presence a family history of psoriasis in 29 cases (64.4%). Mean values of thyroid hormones were significantly lower in patients compared to control; thyroid stimulating hormone TSH (1.6±0.7 vs. 3.35±0.4,p=0.0001), thyroxin T4(0.86±0.2 vs. 1.38±0.2,p=0.0001) and triiodothyronine T3 (3.12±0.4 vs. 4.03±0.6,p=0.0001). Mean values of thyroid hormones were decreased significantly with increasing Psoriasis Area Severity Index PASI (severe versus mild); TSH (1.26±0.8 vs. 2.11±0.1, p=0.03), T4(0.64±0.1 vs. 0.98±0.4,p=0.04) and T3 (2.16±1.2 vs. 3.07±1.9,p=0.04). In addition to, there were no significant between thyroid dysfunction and the following variables; age, sex, duration of disease and the type of psoriasis, p>0.05). **Conclusion:** The current study revealed that thyroid dysfunction is prevalent in patients with psoriasis especially in severe cases, so that early detection is considered crucial to improve final outcome of patients.

KEYWORD:- Psoriasis, PASI, thyroid, hormones, Syria.

1. INTRODUCTION

Psoriasis is defined as chronic, immune-mediated skin disease which results from a polygenic predisposition combined with environmental triggers such as infections, medications, trauma and psychological stress.[1,2,3,4] It is considered as a benign disease in majority of cases, but it might be a lifelong illness with exacerbations and refractory to treatment in some cases.[5,6]

It affects 1-8% of the adults and the main pathogenic mechanisms include dysregulation in innate and adaptive system principally T helper TH 1,17 and might include interferon, tumor necrosis factor(TNF-α), IL-17 and IL-23.[7,8,9,10] There are spectrum of clinical manifestations of disease, in which chronic plaque psoriasis represents the most frequent type and involvement of face, palms, soles, and nails affects the quality of life.[11,12,13] Psoriasis is associated with a group of comorbidities such as insulin resistance, metabolic syndrome, cardiovascular diseases, and psychiatric disorders, as well as autoimmune diseases such as celiac disease, type 1 diabetes mellitus(T1DM), and autoimmune thyroid disease.[14,15] In addition to, studies revealed a link between psoriasis and thyroid hormones disorders, which might be explained by the following mechanisms; stimulating skin proliferation by thyroid hormones , role of long non-coding RNA(IncRNA) regulation in autoimmune diseases, reactive oxygen species, and immunological association in which several inflammatory pathways described in psoriasis and autoimmune diseases.[16,17,18,19,20,21] Psoriasis leads to considerable psychosocial effects with major impact on quality of life, which increased with presence of other conditions. Therefore, the aims of current study were:1-to evaluate thyroid hormones levels in psoriasis patients. 2-to investigate the association between thyroid hormones with the following variables: age, sex, type of disease, duration and severity of psoriasis.

2. PATIENTS AND METHODS

2.1. Study population

This was an analytic study (case-control) of a group of patients with a diagnosis of psoriasis attending department of dermatology at Lattakia University Hospital in Syria during one-year period (2023-2024). The exclusion criteria were presence one of the following: previous surgery of thyroid gland or radiation of the neck, receiving treatment by thyroxine or drugs that affect thyroid function such as glucosteroids, amiodarone, and antidepressant drugs, a history of other autoimmune diseases and renal or liver failure. History and physical examination were performed for all patients including detecting the type of psoriasis and the severity according to Psoriasis Area and severity Index(PASI); mild(PASI<7), moderate(PASI:7-12) and severe(PASI>12). Laboratory investigations including thyroid functions were performed for all patients and compared between two groups. Normal ranges of hormones were as follows; TSH: 0.38-4.31 µl U/mL, FT3:2.3-4.1 pg/mL, FT4:0.7-1.9 ng/dl

2.2. Ethical consideration

After discussing the study with the patients, all of them gave a complete and clear informed consent to participate in the study. This study was performed in accordance with the Declaration of Helsinki and approval for the study was obtained from the institutional ethics committee.

2.3. Statistical analysis

Statistical analysis was performed by using IBM SPSS version 25. categorical variables were reported as numbers and percentages and continuous variable were presented as mean±standard deviation(SD). Chi-square test was used to examine the comparisons between the two groups. Independent t student test was used to compare two independent groups. One –way Anova was used to test statistical differences among the means of two groups. All the tests were considered significant at a 5% type I error rate($p<0.05$), β:20%, and power of the study:80%.

3. RESULTS

The study included a group of 45 patients with a diagnosis of psoriasis who compared with matched group of healthy patients. Age ranged from 11 to 72 years, with mean age of 45.14±12.4years, and male represented 55.6 % of the cases. Plaque psoriasis represented the most frequent kind of psoriasis, accounting for around 68.9% of all cases, followed by palmo-plantar type in 15.6%, nail psoriasis in 13.3% and scalp psoriasis in 13.3%. The least frequent types of psoriasis were erythrodermic, guttate, and Pustular in 8.9%, 4.4%, and 4.4% respectively. Patients were classified according to the severity of disease in three groups; mild in 23 cases(51.1%), moderate in 15 cases(33.3%), and severe in 7 cases(15.6%). Family history was present in 29 cases(64.4%). In addition to, duration of disease ranged from 5 months to 36 years with mean duration of 15.3±11.4 years and 57.8% of the patients were with duration less than 5 years.

Table 1: Demographic and Clinical characteristics of psoriasis patients.

Variable	Result
Age(years)	45.14±12.4(Range:11-72)
Sex,(n,%)	
Male	25(55.6%)
Female	20(44.4%)
Type of psoriasis	
Plaque	31(68.9%)
Palmo-plantar	7(15.6%)
Nail psoriasis	6(13.3%)
Scalp	6(13.3%)
Erythrodermic	4(8.9%)
Guttate	2(4.4%)
Pustular	2(4.4%)
Severity of disease	
Mild	23(51.1%)
Moderate	15(33.3%)
Severe	7(15.6%)
Family history of psoriasis	
Present	29(64.4%)
Absent	34(75.6%)
Duration of disease(years)	
<5	26(57.8%)
≥5	19(42.2%)

As shown in table(2), no significant difference was found between the two groups in terms of age and gender, $p>0.05$. In cases group, mean age was 45.14±12.4 years versus 46.72±13.6 in control group, p:0.7. Males

represented 55.6% and females 44.4% of the patients in cases group, whereas in control group males represented 51.1% and females 48.49% of the patients, p:0.5.

A statistically significant decrease in TSH, FT3, and FT4 was seen in psoriasis patients compared to control group as follows; (1.6±0.72 versus 3.35±0.4), (3.12±0.4 versus 4.03±0.6), (0.86±0.2 versus 1.38±0.2) respectively, p:0.0001, fig(1).

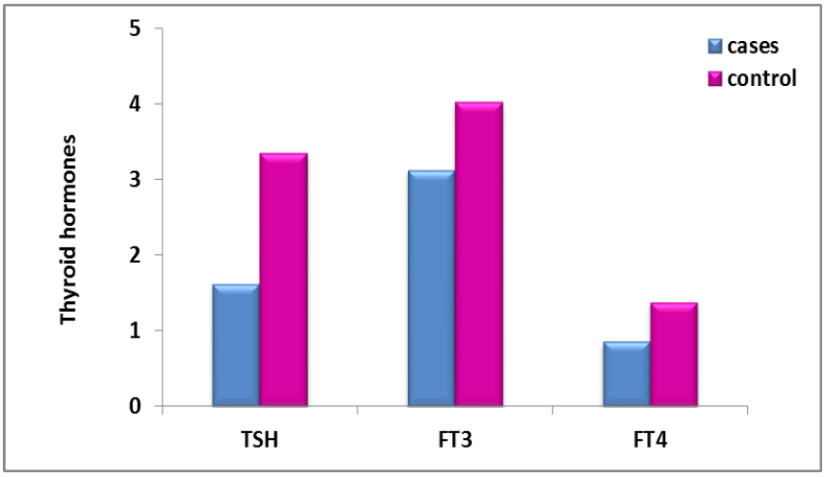

Fig. 1: Comparison thyroid hormones between the two groups.

Table 2: Demographic characteristics and laboratory findings of the study population by comparison of the two groups.

Variables	Cases	Control	P value
Age (years)	45.14±12.4	46.72±13.6	0.7
Sex			
Male	25(55.6%)	23(51.1%)	0.5
Female	20(44.4%)	22(48.9%)	
Thyroid tests			
TSH	1.6±0.72	3.35±0.4	0.0001
FT3	3.12±0.4	4.03±0.6	0.0001
FT4	0.86±0.2	1.38±0.2	0.0001

As shown in table(3), there were no significant association between the levels of thyroid hormones and the following variables(p>0.05): sex, age, duration of disease, family history of psoriasis, and type of psoriasis. Mean levels of thyroid hormones were significantly lower in severe forms of psoriasis compared to mild psoriasis as follows; TSH(1.26±0.8 vs. 2.11±0.1,p:0.03), FT3(2.16±1.2 vs. 3.07±1.9,p:0.01), and FT4(0.64±0.1 vs. 0.98±0.4,p:0.04).

Table 3: Association between the levels of thyroid hormones and characteristics of the patients.

Variables	Thyroid hormones		
	TSH	FT3	FT4
Sex			
Male	1.69±0.7	2.45±1.4	0.68±0.4
Female	1.52±0.7	3.74±1.8	0.92±0.3
p-value	0.4	0.06	0.08
Age group (years)			
<20	2.08±0.3	2.95±1.6	0.65±0.4
20-40	1.92±0.6	3.80±2.1	0.93±0.5
>40	1.74±0.7	2.42±1.1	0.80±0.2
p-value	0.3	0.09	0.1
Duration of disease(years)			
<5	1.54±0.8	3.50±1.7	0.85±0.4
≥5	1.70±0.5	2.51±1.7	0.73±0.4
p-value	0.5	0.06	0.3
PASI			
Mild	2.11±0.1	3.07±1.9	0.98±0.4

Moderate	1.69±0.7	2.56±1.3	0.72±0.2
Severe	1.26±0.8	2.16±1.2	0.64±0.1
p-value	0.03	0.01	0.04
Family history			
Present	1.72±0.6	3.38±1.8	0.83±0.3
Absent	1.46±0.8	2.97±1.7	0.78±0.4
p-value	0.2	0.2	0.6
Type of psoriasis			
Plaque	1.44±0.8	2.57±1.1	0.72±0.4
Palmo-plantar	1.77±1.1	2.58±1.6	0.73±0.6
Nail psoriasis	1.92±0.02	3.30±1.3	1.05±0.1
Scalp	0.99±0.5	3.98±1.8	1.01±0.1
Erythrodermic	1.90±0.1	0.90±0.1	0.50±0.2
Guttate	1.89±0.1	3.75±1.1	0.87±0.4
Pustular	2.1±0.2	1.55±0.6	0.60±0.1
p-value	0.1	0.07	0.3

4. DISCUSSION

This analytic, single-center study investigated the function of thyroid gland in 45 patients with various types of psoriasis who were compared with 45 healthy individuals. The current study showed the main findings: first, patients were from different age groups with mean age 45.14±12.4 years. Second, plaque psoriasis represented the most frequent type with presence of more one type in some patients. Third, severity of disease ranged from mild in 51.1% to severe form in 15.6% with presence of family history of psoriasis in 64.4% of cases. Fourth, mean values of TSH, FT4, FT3 were significantly lower in patients compared to controls, p:0.0001. In addition to, there was significant correlation between severity of disease and thyroid gland disorders in which the levels of TSH, FT4, FT3 were significantly lower in severe forms of diseases compared to mild types ,$p<0.05$. Finally, there were no significant correlation between presence of disorders and the following variables; age, sex, type of psoriasis, duration and family history, $p>0.05$.

Previous findings might be explained by the following; activating of inflammatory pathways by IL-17, IL-23 and TNF-α is included in the pathology of thyroid disease and psoriasis, thyroid hormones are capable of stimulating epidermal growth factor and its continuous might associate with hyper-proliferative cells in psoriasis. In addition to, psoriasis patients revealed high levels of regulatory t cells/IL-17 and T-helper(Th17) in surrounding tissues and thyroid gland, and this pathway might be associated with the pathology of psoriasis and immune-mediated thyroid disorders. The results of current study are consistent with the previous studies.

Juan et al(2021) demonstrated in a study conducted in 468 psoriasis patients presence of significant correlation between the type of psoriasis and thyroid hormones disorders, which observed more frequently in erythrodermic type(p:0.001).7

Senthil et al(2022) showed in a study included 100 psoriasis patients who compared with 100 healthy individuals presence of significant correlation between disorders of thyroid gland and increasing severity of disease and duration($p<0.05$), without any correlation with the type of disease.[23]

Deepak et al(2022) found in a study conducted in 111 psoriasis patients presence of significant correlation between the severity of psoriasis and thyroid hormones disorders(p:0.001) without any correlation with age, sex, duration of disease and the type($p>0.05$).[24]

Luiza et al(2024) demonstrated in a study conducted in 161 patients with psoriasis presence of significant correlation between the severity of psoriasis and thyroid hormones disorders(p:0.08).[25]

5. CONCLUSION

The current study revealed the importance of routine assessment of thyroid hormones in patients with psoriasis especially in severe cases for early diagnosis and initiating proper interventions to improve final outcome of patients. We recommended for performing studies included a large number of patients with calibration thyroid hormones for many times with thyroid peroxidase antibodies for an additional information about this association.

Competing of interests

All the authors do not have any possible conflicts of interest.

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