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Original Article

Frequency of thyroid disorders in patients with chronic plaque psoriasis and psoriatic arthritis

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Abstract

Objective To calculate the frequency of thyroid disorders in patients with chronic plaque psoriasis and psoriatic arthritis.

Methods The cross-sectional study was conducted in Dermatology department, Sir Syed College of Medical Sciences and Sir Syed Hospital, Karachi. Study period was 6 months from 1st June 2017 to 30th November 2017. Clinically diagnosed or biopsy proven 112 cases of chronic plaque psoriasis with or without arthritis, of either gender, age 18 years and above were included via non-probability consecutive sampling technique. Serum free T3, free T4 and TSH levels were performed and results were recorded.

Results In my study, the mean age was 43.51±13 years. Mean duration of disease was 7.75 years. Out of 112 patients, 53 (47.3%) were male and 59 (52.7%) were female. 52 (46.4%) patients had type I while 60 (53.6%) had type II plaque psoriasis. Psoriatic arthritis was present in 54 (48.2%) and absent in 58 (51.8%) patients. Mean BMI was 27±5.9 kg/m2 and 71 (63.4%) patients were obese. 17 (15.2%) patients were found to have thyroid disorders (P=<0.001); among these 13 patients had subclinical hypothyroidism. Thyroid function abnormalities were more commonly found in females (P=0.014). But no association of thyroid function abnormalities was noted with age of patients, type of plaque psoriasis, presence of psoriatic arthritis, duration of disease and BMI.

Conclusion This study suggests that thyroid disorders and subclinical hypothyroidism are frequent among psoriasis patients. Thyroid function abnormalities are statistically associated with female sex but not with age of patients, type of plaque psoriasis, presence of psoriatic arthritis, duration of disease and BMI.

Key words
Chronic plaque psoriasis, psoriatic arthritis, thyroid disorders, subclinical hypothyroidism, frequency.

Introduction

Psoriasis is a common, chronic, immune-mediated inflammatory disease that affects skin, joints, nails and scalp but no organ or system of the human body is immune from direct or indirect effects of psoriasis.[1] Cutaneous disease has many clinical types and a large number of morphological variants. The most common clinical form is plaque psoriasis. The prevalence of psoriasis in general population is 2%[2] with equal male and female involvement and 75% of cases reported before 46 years of age all over the world.[3]

Henseler and Christophers in 1985 described two types of plaque psoriasis in adults.[4] Type 1

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is "early onset" and mostly hereditary, strongly HLA associated, more likely to be severe with large body surface area involvement and frequent remission and relapses. Type 2 is "late onset" and sporadic, non-HLA associated, mild and stable disease. Arthritis and nail disease are common to both types.

Psoriasis and psoriatic arthritis (PsA) both are inflammatory disorders and have been associated with a higher prevalence of metabolic syndrome (MetS); obesity, dyslipidaemia, type II diabetes mellitus (T2DM), hypertension, non-alcoholic fatty liver disease, hyperuricemia, cardiovascular disease and vitamin D deficiency.[5-10] Association of psoriasis with thyroid disorders remains a topic of controversy; some studies reported significant association between the two while others showed no relevance. Few studies found high circulating levels of thyroid autoantibodies in psoriasis patients while others denied it completely. No local study has been published yet on the same topic. Therefore, the aim of this study was to determine the frequency of thyroid disorders in psoriasis and psoriatic arthritis patients, and association between psoriasis and thyroid disorders, if any.

Methods

This cross sectional study was conducted in the Department of Dermatology, Sir Syed College of Medical Sciences and Sir Syed Hospital, Karachi from 1st June 2017 to 30th November 2017. The cases were selected via non probability consecutive sampling technique. 112 adult subjects meeting the selection criteria for this study were selected after written informed consent.

Adult cases of either gender who were clinically diagnosed or biopsy proven cases of chronic plaque psoriasis with or without arthritis were included in the study. Patients already diagnosed with hypothyroidism or hyperthyroidism, patients with other forms of psoriasis (like guttate, pustular, erythrodermic), chronic liver and kidney diseases, end organ failure, malignancy, patients on drugs which alter thyroid hormone levels or cause hypothyroidism (like anti-psychotics, interferons etc.), pregnant and lactating mothers were excluded.

After enrolment of patients; their age, gender, duration of disease, type of plaque psoriasis, weight, height, body mass index (BMI) in kg/m^2, presence or absence of arthritis along with type of PsA were noted. Serum Free T3, free T4 and thyroid stimulating hormone (TSH) levels were performed in all cases.

Definitions and Diagnostic Criteria

Chronic means the disease should be present for a minimum of 6 months. A plaque is a circumscribed, superficial, elevated area of more than 1.0 cm in diameter. Its surface is usually flat. Plaque psoriasis consists of erythematous, scaly, sharply demarcated, indurated plaques present particularly over the extensor surfaces and scalp.[1]

Obesity definition was used given by WHO Western Pacific Regional Office for Asians.[11]

BMI = 23.0 to 24.9 kg/m^2 as overweight and BMI > 25.0 kg/m^2 as obesity.

Type of plaque psoriasis was decided according to Henseler and Christophers' division.[4] Those who developed disease before 40 years of age were labelled as type 1 and those at 40 years or after were labelled as type 2.

PsA was diagnosed by using CASPAR (Classification Criteria for Psoriatic Arthritis) criteria.[12] It has sensitivity of 99% and

specificity of 91%. According to CASPAR criteria; a patient with inflammatory articular disease (joint, spine or entheseal) must have three or more points from five categories before labelling him with PsA. Each category scores a maximum of 1 point, except category 1, which scores 2 points for current psoriasis **(Table 1)**.

Type of PsA was characterized according to Moll and Wright classification **(Table 2)**.[13] We also added one more type as mixed arthritis after 5 traditional types of PsA because of considerable overlap between different types.

The data feeding and analysis was performed on computer package SPSS (statistical package of social sciences) version 22.0. Clinical characteristics were summarized in terms of frequencies and percentages for qualitative variables. Mean±S.D for quantitative variables was done. Stratification was done with regard to duration, type of psoriatic arthritis and BMI. Chi Square and Fisher's Exact tests were applied as required. P value <0.05 was considered as significant.

Results

Out of 112 patients enrolled in the study, 53 (47.3%) were male and 59 (52.7%) were female. 52 (46.4%) patients had type I while 60 (53.6%) had type II plaque psoriasis. Psoriatic arthritis was present in 54 (48.2%) and absent in 58 (51.8%) patients. Frequency distribution of type of PsA showed that majority (28 patients) had mixed form of arthritis, followed by predominantly peripheral mono or asymmetrical oligoarthritis (17 patients), predominantly symmetrical, rheumatoid-like, rheumatoid factor negative polyarthritis (6 patients) and predominantly distal interphalangeal arthritis (3 patients).

Mean age of patients and duration of disease was 43.51±13 years (range 18 to 69) and 7.75 years respectively. Frequency distribution of duration of disease showed that 38 (33.9%), 20 (17.9%), 28 (25%), and 26 (23.2%) patients had

Table 1 CASPAR Criteria for Psoriatic Arthritis

Table. The CASPAR classification criteria for PsA

To be classified as having PsA, a patient must have inflammatory articular disease (joint, spine, entheseal) with ≥ 3 of the following 5 points:

Criterion	Description
1. Evidence of psoriasis (one of a, b, c):	
(a) Current psoriasis[a]	Psoriatic skin or scalp disease currently present, as judged by a rheumatologist or a dermatologist
(b) Personal history of psoriasis	A history of psoriasis obtained from patient or family physician, dermatologist, rheumatologist, or other qualified health care professional
(c) Family history of psoriasis	A history of psoriasis in a first- or second-degree relative by patient report
2. Psoriatic nail dystrophy	Typical psoriatic nail dystrophy, including onycholysis, pitting, and hyperkeratosis observed on current physical examination
3. Negative test result for RF	By any method except latex but preferably by ELISA or nephelometry, according to the local laboratory reference range
4. Dactylitis (one of a, b):	
(a) Current	Swelling of an entire digit
(b) History	A history of dactylitis recorded by a rheumatologist
5. Radiological evidence of juxta-articular new bone formation	Ill-defined ossification near joint margins (excluding osteophyte formation) on plain x-ray films of hand or foot

CASPAR, CIASsification criteria for Psoriatic ARthritis; PsA, psoriatic arthritis; RF, rheumatoid factor; ELISA, enzyme-linked immunosorbent assay.

[a] Current psoriasis scores 2; all other items score 1.

Table 2 Moll and Wright classification of psoriatic arthritis

1. Predominantly peripheral mono or asymmetrical oligoarthritis
2. Predominantly distal interphalangeal arthritis
3. Predominantly symmetrical, rheumatoid-like, rheumatoid factor negative polyarthritis
4. Arthritis mutilans
5. Predominantly axial arthritis
6. Mixed form of arthritis

Table 3 Comparison of male and female psoriasis patients

Gender	*Male*	*Female*
Age (years)	45.23	41.97
Duration of disease (years)	8.53	7.05
BMI (kg/m^2)	25.24	28.59
Type of plaque psoriasis I/II	24 / 29	28 / 31
Hypothyroid	3	12
Euthyroid	50	45
Hyperthyroid	0	2
Psoriatic arthritis present / absent	21 / 32	33 / 26

disease for 0.5 to 2 years, 2 to 5 years, 6 to 10 years and more than 10 years respectively.

Mean BMI was 27±5.9 kg/m^2 and only 2 (1.8%) patients were underweight and 23 (20.5%) patients were healthy i.e. BMI of 18.5 to 22.9 kg/m^2 while 16 (14.3%) and 71 (63.4%) patients were overweight and obese respectively.

Overall, frequency of thyroid disorders among patients of psoriasis and psoriatic arthritis was 15.2%. Results of thyroid function tests showed that 95 (84.8%) patients were euthyroid, 15 (13.4%) were hypothyroid and only 2 (1.8%) were hyperthyroid. P value is < 0.001. Out of 15 hypothyroid patients; 13 (86.67%) were having subclinical hypothyroidism. The other two and hyperthyroid patients were symptomatic.

Upon analysis; females were more commonly had thyroid disorders as compared to males. P value was 0.014. However, no significant association was noticed when thyroid function abnormalities were compared with age of patients, type of plaque psoriasis and presence of psoriatic arthritis. P values were 0.119, 0.701 and 0.248 respectively. Similarly, no association was noticed between thyroid function abnormalities versus duration of disease and BMI. P value was found to be 0.817 and 0.235 respectively.

Upon comparison of gender; mean age and duration of disease is less while BMI is slightly higher in females as compared to males **(Table 3)**. No statistically significant difference was observed between two genders except in frequency of thyroid disorders which is higher in females.

Discussion

Psoriasis is now regarded as multifactorial and multisystem disease with predominant skin and joints involvement.[2] Numerous genetic, hormonal, metabolic and environmental factors play their roles in aetiology and pathogenesis of psoriasis. Several HLA associations and genes for psoriasis have also been reported. PSORS1 gene has been reported as the major genetic determinant of psoriasis and it accounts for 35–50% of the heritability of the disease.[14] The linkage of psoriasis with many systemic and autoimmune diseases making it further difficult for us to understand and elaborate the exact pathogenesis of psoriasis.

My study reported that 15.2% patients of psoriasis and PsA have thyroid disorders and most of them had hypothyroidism. Among these a significant percentage of patients had subclinical hypothyroidism (86.67%). Patients with subclinical hypothyroidism have high TSH levels with normal T3 and T4 levels, and usually without symptoms.[15]

Zoabi et al. reported that patients with severe psoriasis had increased TSH levels and positive thyroid autoantibodies.[16] Antonelli et al. also reported that subclinical hypothyroidism is common in women with PsA as compared to general population.[17] Azizian also notified that psoriasis patients have hypothyroidism more commonly than controls.[18] Ruffilli et al. reported high anti-thyroid peroxidase antibody titers, a hypoechoic thyroid gland on ultrasound and high prevalence of subclinical hypothyroidism in psoriasis and PsA patients.[19] Similar results were also shown in a meta-analysis performed by Khan et al.[20] All these results are consistent with my study.

Limitation

Small number of sample, lack of controls, and thyroid autoantibodies are missing. Addition of these will make a great impact on this research.

Conclusion

Association of thyroid disorders with psoriasis remains a disputed topic. Different studies showed completely opposite results. This study has reported a noticeable frequency of thyroid disorders in patients of psoriasis and psoriatic arthritis. Females are more commonly affected than males and a high percentage of subclinical hypothyroidism is noticed among psoriasis patients. We recommend to check thyroid function tests in all patients with psoriasis and psoriatic arthritis. Early detection of thyroid disorders and prompt treatment may prevent from complications and further worsening of both diseases.

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