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Association of Metabolic Syndrome Components among patients with psoriasis in Duhok (Iraq)

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Abstract

Background: Psoriasis is thought to be one of the systemic diseases with possible health consequences beyond the skin; studies suggesting psoriasis relation to metabolic syndrome are debatable. Objectives: This work sought to determine whether the components of psoriasis and metabolic syndrome are related. Methods: The research included 117 individuals with recognized psoriasis, ranging in age from 18 to 65. A total of three groups have been created based on their PASI scores: there were 33 moderate cases, 80 mild cases, and 4 severe instances of psoriasis. Body height, blood pressure, weight, waist circumference (WC), total cholesterol, blood glucose, HDL-c, uric acid, LDL-c, and triglycerides were examined in each instance. Results: When put to comparison with the mild group, the moderate to severe psoriasis group had considerably high triglycerides (p=0.012). Of the patients examined, 75.2% were obese and overweight and 71.8% have been centrally obese. Psoriasis was shown to be positively correlated with dyslipidemia (triglycerides > 150mg/dl, 34.2%; HDL-c 40mg/dl, 24.8%); 59% of the patients had a cluster of 2 or more metabolic syndrome components, while 17.90% did not have these symptoms. Conclusion: The findings show that over two-thirds of cases were obese or overweight and that more than half (59.0%) exhibited at least two signs of metabolic syndrome.

Keywords
psoriasis, metabolic syndrome, obesity, dyslipidemia.

Psoriasis can be defined as one of the systemic immune-mediated polygenic skin disorders that could be brought on by a variety of environmental triggers, such as infections, trauma, or drugs, in those who are predisposed to the disease[1]. Patients who have moderate to severe psoriasis have elevated relative risks for atherosclerotic CVD and metabolic syndrome[2]. Psoriasis is increasingly believed to be a systemic disease with possible

health consequences beyond skin[3]. Based on many studies done before, 35% to 90% of psoriasis patients have a positive family history[4].

Various studies on the relationship between metabolic syndrome and psoriasis have produced conflicting findings. The connection between the severity and duration of psoriasis and the emergence of the metabolic syndrome is also poorly understood[5]. The burden of mortality and morbidity linked with metabolic syndrome is substantial. The relation regarding such two conditions offers early opportunity for psoriasis patients to be diagnosed with and treated for metabolic syndrome, which can significantly lower mortality and morbidity from non-communicable diseases[6]. Patients with psoriasis had a greater prevalence of metabolic syndrome, in various degrees[7,8]. There is a significant knowledge gap in the pathophysiology related to metabolic syndrome and psoriasis, and our region has few data on the relationship between the two conditions.

Material and methods

Study population

A sample of 157 psoriatic patients who visited the dermatology department (n=157) was chosen using a random selection approach. Due to incomplete data, the reminders were not included in the research, which included 117 of these participants. Using PASI (Psoriasis Area and Severity Index) calculation, participants have been divided into three groups[9]. patients with moderate psoriasis (n = 33), mild psoriasis (n = 80), and severe psoriasis (n = 4) were grouped together for proper statistical analysis due to the small number of severe cases. Approximately 82 of the 117 individuals were female and 35 were male, with years ranging from 18 to 65. All of the participants have given their informed consent. The study protocol has been accepted by the board of the postgraduate committee of Duhok Univ., College of Medicine and the postgraduate and ethical committees of the Duhok Health Directorate.

Data Collection

A pre-tested survey intended to gather data on the date of birth, gender, height, blood pressure, weight, waist circumference, use of prescription drugs, and dietary supplements for minerals. According to PASI, the skin regions affected by psoriasis have been identified and divided into moderate, mild, and severe cases. Duration of psoriasis were recorded in years, whether any comorbid diseases were present, and any family history of diabetes, hyperlipidemia, hypertension, or metabolic syndrome.

The BMI was calculated for analysis using the measurements of weight and height for each individual as follows: weight in (kg) divided by height in squared meters m^2. BMI no more than 25 was seen as normal, whereas BMI 25 to 29.90 has been considered as overweight, and BMI value of 30 or higher has been regarded as obese[10]. WC (Waist Circumference): it has been measured to nearest 0.1cm at the highest iliac crest point during high point. Central obesity: WC > 88cm in the females and > 102cm in the males[11].

Collection of Blood Samples

Following 12-14-hour overnight fast, phlebotomy was conducted between the hours of 9 and 11 in the morning. Prior to the phlebotomy, participants have been instructed to refrain from engaging in any strenuous physical activities for at least 2 hrs. The antecubital vein was venipunctured to obtain blood samples, which were then collected in the BD Vacutainer System CAT-plain tubes. The serum has been separated through the use of the centrifugation with the use of HITACHI centrifuge (model O5P-21) at 5000 rpm for 10mins. The sera were then separated and after that gathered and labeled numerically for later examination in a simple tube. The serum from each patient was after that processed right away by the clinical chemistry analyzer Lisa.Xs (open, discrete, random access, automated) in the lab. of Azadi General Teaching Hospital to measure serum total cholesterol, HDL-C, serum triglycerides, serum uric acid, and blood sugar.

Statistical Analysis

SPSS version 18.0 has been utilized for analyzing all data, and paired student t-tests were utilized to compare serum analyte levels between groups. Chi-square test has been utilized in order to determine the importance of association between

the different risk factors. P value (measure of statistical significance) was set < 0.05.

Results

Psoriasis and gender

Table1 exhibits the baseline characteristics regarding the participants divided depending on their gender. BMI, Age, blood pressure, WC, total cholesterol, glucose, LDL-c, uric acid, HDL-c, and PASI index did not show any significant sex differences. Males had significantly greater levels of triglycerides than females (p=0.031).

Table1. Baseline features of the patients under study

Characteristics	Gender		
	Males (n=35) mean±SD	Females (n=82) mean±SD	
Age (years)	40.63±13.40	38.81±12.95	NS
BMI (Kg/m^2)	29.2±5.65	30.5±6.67	NS
WC (cm)	103.7±11.89	105.5±17.82	NS
Systolic blood pressure (mmHg)	127.9±18.55	126.5±19.81	NS
Diastolic blood pressure (mmHg)	78.6±12.16	79.1±12.87	NS
FBG (mg/dl)	107.1±43.78	99.7±34.75	NS
Total cholesterol (mg/dl)	187.3±31.2	181.7±30.02	NS
Triglycerides (mg/dl)	154.2±67.39	128.7±47.01	S*
HDL-c (mg/dl)	42.2±5.39	44.3±4.68	NS
LDL-c (mg/dl)	114.7±29.86	108.9±23.37	NS
Uric acid (mg/dl)	4.7±0.65	4.29±0.72	NS
PASI index	10.1±7.26	7.2±4.84	NS
*P=0.031, NS: p>0.05			

Table 2 shows the relation between groups based on anthropometric and lipid data as well as the PASI index. With regard to mean values for blood pressure, age, FGB, length of psoriasis disease, total cholesterol, HDL-c, uric acid and LDL-c, PASI revealed no significant differences between groups; nevertheless, WC and BMI were significantly different (p=0.01 and p=0.006, respectively). Additionally, the moderate to severe psoriasis group had significantly greater triglycerides (p<0.01) than the mild group. In comparison to the mild group, patients with moderate to severe psoriasis had a significantly greater prevalence of metabolic syndrome (p=0.04).

Table 2. The relationship between groups according to the PASI index and both anthropometric and lipid parameters

	PASI		
Variable	Mild (n=80) mean±SD	Moderate and severe (n=37) mean±SD	P value
Age	38.5±13.97	41.5±10.96	0.273
BMI (Kg/m^2)	28.9±6.61	32.5±5.31	0.006
WC (cm)	102.0±17.12	111.6±11.29	0.010
Systolic blood pressure (mmHg)	126.3±19.46	128.8±18.56	0.610
Duration of psoriasis (Years)	6.3±7.10	8.4±6.4	0.210
FBG (mg/dl)	98.8±31.54	110.4±50.41	0.100
Total cholesterol (mg/dl)	173.2±29.98	182.6±34.85	0.070
Triglycerides (mg/dl)	131.5±50.52	146.5±44.98	0.012
HDL-cholesterol (mg/dl)	43.9±4.59	42.7±5.46	0.21
LDL-cholesterol (mg/dl)	102.6±26.19	108.4±27.3	0.400
Uric acid (mg/dl)	4.3 ±0.74	4.3±0.63	0.73
Metabolic syndrome n(%)	55(68.7)	32(86.5)	0.04
Positive family history of diabetes n(%)	28(35.3)	16(47.6)	0.39
Positive family history of hypertension n(%)	41(51)	19(57.2)	0.8
Positive family history of psoriasis n(%)	28(35.3)	13(38.1)	0.71

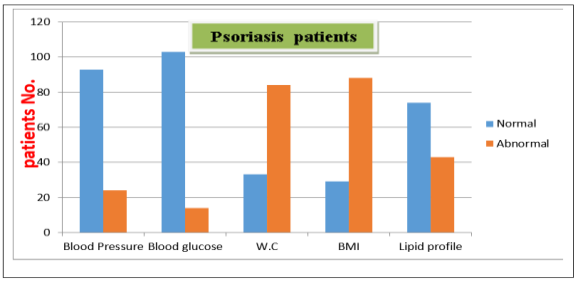

Figure1. Distributions of various metabolic syndrome components in the patients under study

We estimated the incidence percent regarding the metabolic syndrome components to identify which anthropometric or lipid parameter was significantly linked with psoriasis in the patients under study. The outcomes are shown in (Figure 1). As can be seen, 88.2% of the population was obese or overweight, 24.5% had hypertension, 14.0% had type 2 diabetes, and 28.8% had dyslipidemia.

*Patients distribution based on total number studied (n=117)

Of 117 patients, 69 (59.0%) had two or three metabolic syndrome components, with 44 (37.5%) having two and 25 (21.4%) having three. Twenty-one (17.9%) of the patients under study had mild psoriasis and none of them had metabolic syndrome, whereas 15 (12.8%) of them had four components and 12 (10.3%) had just one (Figure 2).

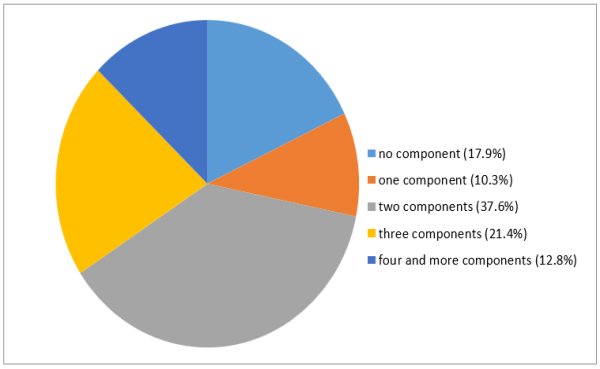

Figure 2. Components of metabolic syndrome in psoriatic patients

Discussion

The significant relation between the anthropometric parameters of WC and BMI and the severity of psoriasis is this work's most notable conclusion. As 75.2% of the cases investigated were obese and overweight and 71.8% have been centrally obese, such findings support the link between psoriasis and obesity. Those findings are consistent with earlier research[12,13] .

Furthermore, we found a significant association between psoriasis and metabolic syndrome, with a greater incidence of the condition in the group of the moderate to severe psoriasis compared to the mild instances. Our results suggested that there is a correlation between psoriasis and metabolic syndrome in both mild and moderate to severe cases; 82.1% of these cases had the syndrome, indicating that the metabolic syndrome's components are a key mechanism by which dyslipidemia and obesity could affect psoriasis risk factors. Despite the fact that the difference was not statistically significant, men have a higher mean PASI score than women. According to several earlier studies, women had a higher significant connection between PASI score levels and metabolic syndrome components than men did[14]. Yet, several research had indicated either no sex difference[15,16,17], or a male dominance[18,19,20]. According to a study conducted in Saudi Arabia, 5.3% of people have psoriasis. There has been a male preponderance with a 1.4:1 sex ratio [21].

David et al. noted a comparable result [22]. In the Swedish registry for systemic psoriasis therapy, approximately 59% of patients and 63% of those beginning biologic therapy were men. Men are even more disproportionately represented in European systemic psoriasis therapy registries, with rates ranging between 68% in Netherlands and 60% in Germany [23]. Hotard et al. noted that even though more women sought medical attention for their psoriasis, just 39% of patients receiving systemic therapy were female [24]. Yet, the patients in this work who attended the dermatology department have been more likely to be women compared to men (1.0:0.43); a comparable result for female predominance in comparison to male was indicated [25]. In the presented work, it was shown that there is a connection between high blood pressure and psoriasis. Of patients examined, 24.5% had hypertension, and 51.30% of psoriasis patients had a family history of the hypertension. According to Middle Eastern research, the frequency of elevated blood pressure varied depending on the severity of psoriasis. For example, in the medium and mild instances of psoriasis (PASI<10), the frequency was 32%, while in the severe cases (PASI>10), it was 40.30%, and in controls, it has been 11.60%. [26]. When the relationship between psoriasis and high blood pressure has been studied in united kingdom, the prevalence of high blood pressure was found to be 14.7% in mild cases, 20% in severe cases, and 11.9% in the control group[27].

A positive family history of DM was detected in 37.6% of the psoriasis patients investigated, and 12.0% of the people with increased serum fasting glucose levels over 126 mg/dl, a criteria for the metabolic syndrome. While several international studies [28,29] found comparable results to ours regarding serum fasting glucose, other works did not concur with our results [30,31]. In a research involving 581 patients, Sommer et al.

found a two-fold increase in MS and a significant relationship between T2DM and psoriasis, hyperlipidemia, hypertension, and coronary artery disease [32].

The findings of our study showed dyslipidemia in psoriatic patients, and this has been strongly connected with the condition severity, namely with the triglycerides. Many studies conclusively show that psoriasis patients have an altered lipid profile [33,34]. The findings of the present study have been in line with a few Iraqi research [12,35] which demonstrated atherogenic lipid profile in psoriatic patients when put to comparison with matched controls, particularly in those with severe disease. Based on the discovery of functional and structural abnormalities in practically every segment of the gastrointestinal tract, various abnormalities in the digestive system have been hypothesized as the cause of the greater susceptibility of psoriatic patients to develop hyperlipidemia[36]. Additionally, psoriasis-related immune system activation could result in a few changes to the patient's lipid profile [33].

Limitations of our study

The short sample size and lack of control groups were the primary limitations of the present investigation. Another drawback was the absence of pro-inflammatory and pro-thrombotic markers evaluation.

Conclusion

Our findings support the notion that the main features of metabolic syndrome are present in psoriasis patients. Over two thirds of the psoriasis patients we saw were obese or overweight. Patients with moderate to severe psoriasis exhibit more lipid abnormalities than those with mild psoriasis, particularly in the case of triglycerides. Additionally, the metabolic syndrome's two and three components were present in no less than 50% of the patients.

Recommendations

For a better knowledge of the nature of psoriasis and its relationship with components of the metabolic syndrome, additional research with a sizable sample size of patients and healthy participants could be helpful.

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Conflict of interest

All authors declare that they do not have any potential conflicts of interest to be disclosed.

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