

Prevalence of Metabolic Syndrome in Patients with Psoriasis

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Abstract

Objective: The study was planned to determine the frequency of metabolic syndrome in patients with psoriasis.

Study Design: This was a cross sectional study.

Place and duration of study: This study was conducted over a period of 6 months at the department of General Medicine, PAF Hospital, and Islamabad, Pakistan from 1st January 2022 to 30 June 2022.

Methodology: A total of 100 patients diagnosed with psoriasis using non-probability consecutive sampling were included in the study. The patient's complete history was taken, and thorough clinical examination was carried out at the time of inclusion. This included the age, height, weight, blood pressure, waist circumference and duration of disease. Patients were advised to fast blood sugar, fasting triglycerides, and fasting high density lipoproteins. Metabolic syndrome was diagnosed if patients had ≥ 3 out of 5 criteria for the modified version of National Cholesterol Education Program Adult Panel III.

Results: Out of 100 patients of psoriasis, 37 (37%) patients had metabolic syndrome while 63 (63%) had no metabolic syndrome. The mean \pm SD of all the parameters of metabolic syndrome were found raised in psoriatic patients than normal values both in male and females. No correlation was found between prevalence of MetS and duration of disease ($p=0.16$).

Conclusion: There is a high prevalence of metabolic syndrome in psoriatic patients that can lead to high cardiovascular events. Hence the patients having psoriasis must be screened on a yearly basis for these controllable risk factors to reduce incidence of CV morbidity and mortality.

Keyword; Blood pressure, Dyslipidemia, Fasting Blood Sugar, Metabolic Syndrome, Psoriasis

Cite this article: Azhar M. Prevalence of Metabolic Syndrome in patients with psoriasis. BMC J Med Sci. 2023. 4(2): 11-15

Introduction

Psoriasis is among common chronic inflammatory skin diseases and adult population in a range of 0.5-11.4% is globally affected from this disease while the incidence in children is reported to be 0.1-1.5%.¹ this high ratio indicates a health care burden as reported cases climbs up to as high as 125 million.²

Focus on pathogenesis reveals processes like

dilation along with accumulation of inflammatory cells. Complex interactions of factors like immunogenic modulators, self-antigens, and genetic vulnerability are.

Involved and these coupled with environmental influences induce immune reactions. Among the environmental factors, there are streptococcal pharyngitis, low humidity, stressful life conditions and traumas, smoking, obesity, HIV infection and certain drugs.^{3,4,5} There is increased proinflammatory cytokines release that causes damage to multiple tissues in the long term.⁶

Authorship Contribution: ¹ Substantial contributions to the conception or design of the work; or the acquisition, data analysis, drafting the work or revising it critically for important intellectual content, Final approval of the version to be published & supervision

Funding Source: none

Conflict of Interest: none

Received: August 3, 2023

Accepted: December 15, 2023

Published: December 20, 2023

hyperproliferation of epidermis, dermal blood vessels

Hence, psoriasis is an immunomodulatory driven disease of the skin and can affect patient's physical and mental health over the long run. The disease strikes daily activities of the patients, commonly involving the nails and progressing to incapacitating arthritis.⁷ Clinical manifestations of psoriasis are the well demarcated, Symmetrical, chronic, erythematous, scaling plaques and papules particularly present at scalp and extensor surfaces.^{2,8}

Psoriasis is considered as a systemic disease that is frequently present with other co morbidities like cardiovascular diseases (CVD), psoriatic arthritis, Crohn's disease, depression, and some types of cancers.⁹

In metabolic syndrome (MetS), there is a lack of balance between energy storage and utilization. As recommended by NCEP ATP III (National Cholesterol Education Program's Adult Panel III), presence of any three out of five conditions including central obesity, elevated fasting plasma glucose, elevated blood pressure, low high density and high serum triglycerides defines the presence of MetS.¹⁰ So the obesity, hyperlipidemia, insulin resistance and hypertension make the spectrum of metabolic syndrome. These raised parameters lead to inflammation that is mediated by release of certain immunological cytokines.¹¹ All the above raised parameters of MetS have proven links with the increased CV risk and therefore high incidence of CV events including myocardial infarction (MI).¹²

A pathogenic path that is driven by TNF- α , IL 17, IL-22, IL-23 and IFN- γ is involved both in psoriasis and MetS. This indicates a possible correlation between MetS and psoriasis.¹³

The levels of a chemical mediator called adiponectin are found to be lower in both the diseases describing a possible link between the two. This chemical mediator has known the property of increasing the insulin sensitivity and having anti-inflammatory and anti-thrombotic functions. We can thereby assess the increased incidence of CV risk with this common factor between MetS and psoriasis.^{14,15,16,17}

The raised incidence of CV mortality found in a number of studies conducted in psoriatic patients may be due to the frequent presence of CV risk factors in psoriasis.^{18,19}

Researchers have collected data globally to find the coexistence of psoriasis with obesity, diabetes, hypertension, and hyperlipidemia but the topic is not frequently studied in Pakistan and only a few studies are available. Our study was therefore aimed to find the frequency of MetS in psoriatic patients. We also worked

on finding the levels of different parameters of metabolic syndrome in psoriatic patients of Pakistan which will help to set up a more logical and comprehensive strategy for the management of the disease to prevent the possible CV outcomes.

Material and Method

This cross-sectional study was conducted over a period of 6 months at the department of General Medicine, PAF Hospital, Islamabad, Pakistan from 1st January 2022 to 30 June 2022.

A total of 100 patients diagnosed with psoriasis using non-probability consecutive sampling were included in the study. The patient's complete history was taken, and thorough clinical examination was carried out at the time of inclusion. This included the age, height, weight, blood pressure (BP), waist circumference (WC) and duration of disease. Patients were advised for fasting blood sugar (FBS), fasting triglycerides (FTg) and fasting high density lipoproteins (FHDL).

Metabolic syndrome (MetS) was declared as per modified version of NCEP ATP III, as presence of $>$ or $=3$ of the following: Hypertension ($>$ or $=130/85$ mmHg); fasting plasma glucose was $>$ or $=6.1$ mmol/L; fasting plasma triglycerides $>$ or $=1.69$ mmol/L; fasting HDL-cholesterol <1.04 or <1.29 mmol in males and females, respectively; or subjects were receiving treatment for their condition; waist circumference >88 or 102 cm (Asian WHO criteria $>$ or $=80$ or 90 cm) in females and males, respectively.¹⁰

Data was analyzed using SPSS version 26. The quantitative variables like age, duration of disease, WC, FBS, systolic & diastolic BP, fasting high density lipoproteins and fasting triglycerides were calculated by taking means and standard deviation. Qualitative variables like sex and prevalence of MetS were calculated by frequencies and percentages. The Chi square test was used to compare the significance of difference where needed. A p-value of 0.05 was taken as significant. Written consent was obtained from all the patients. Permission for conducting study was taken from ethical committee of PAF Hospital, Islamabad, Pakistan.

Results

The age range in this study was from 20-64 years with mean age of 45.59 ± 10.83 years, while duration of disease was from 2 to 21 years with mean duration of disease 9.31 ± 4.87 years, as shown in Table-I.

Out of these 100 participants, 69 (69%) were males while 31 (31%) were females as shown in Table-II.

Demographics	Mean±SD
Age (years)	45.59±10.83
Duration of Disease (years)	9.31±4.87

Gender	Frequency	%age
Male	69	69%
Female	31	31%
Total	100	100%

Metabolic syndrome was present in 37 patients (37%) out of these 100 psoriatic patients included in this study as shown in table-III.

Mean±SD of parameters of metabolic profiles in psoriatic patients are given in Table-IV.

Correlation between duration of psoriasis and MetS was also recorded as given in Table-V.

MetS	Frequency	%age
Yes	37	37%
No	63	63%
Total	100	100%

Metabolic Parameter	Mean±SD	
	Males (n=69)	Females (n=31)
WC (cm)	97.507±9.73	90.612±11.24
FBS (mmol/lit)	6.224±0.88	6.219±0.85
DBP (mm)	85.449±8.89	82.58±6.69
SBP (mm)	126.275±14.81	120.935±9.85
Tgs (mmol/lit)	1.61±0.14	1.613±0.10
HDL (mmol/lit)	1.027±0.26	1.296±0.12

Duration of Disease	Prevalence of MetS		p- value
	Frequency	%age	
Less than 10 years (n=62)	22	35.4%	0.160
10 years or above (n=38)	15	39.4%	

Discussion

Although immune mediated disease, genetic as well as environmental factors have been shown to play important roles in clinical manifestations of psoriasis. Studies and

investigations in the past few years have indicated that it is not limited to skin and joints as thought earlier but also associated with MetS. Hence, it's a disease having link to important metabolic risk factors like obesity, hyperlipidemia, diabetes, and hypertension.

Studies aimed at the purpose of finding the co-existence of psoriasis and MetS have found appreciable data on the subject in different countries. Gisondi et al reported a significantly higher prevalence of MetS (30.1%) in a study with 338 psoriasis patients compared to control subjects.²⁰ Nisa et al also studied the co-relation in 150 psoriasis patients and reported a statistically significant 28% prevalence of MetS compared to 6% in controls.²¹ A recent study with 104 patients conducted in Bangladesh by Bhuiyan MA reported 31% of the psoriatic patients had MetS.²²

In Pakistan, small data is available on this subject. In 2018, Ghias A reported in 100 Pakistani patients of psoriasis that 41% patients were having MetS as a co morbidity.²³ Raza MH in a study conducted in Pakistan shared the results that out of 80 psoriasis patients, 39 patients (48.8%) also had MetS.²⁴ Malik T in a study published in 2022 reported 56.52% incidence of MetS in psoriasis patients which was statistically significant when compared with control group.²⁵ Results of our study are also in line with the above studies conducted to find the prevalence of MetS in patients with psoriasis. The mean age of patients consulting with psoriasis to the hospital was 45.59±10.83 years while the main duration of disease was 9.31±4.87 years. The male gender was dominant (69%) in the study compared to female patients (31%). These figures are in the same range as reported in demographics of most of the studies previously done with psoriatic patients.^{22,23,24,25,26}

The prevalence of MetS in our study patients was 37%. The same range of percentage prevalence were reported in studies done by Bhuiyan MAA, (31%), Ghias (41%), Raza MH (48.75%), Azfar NA (36.2%), Malik T (56.52%) and Aggarwal K (30%) in Pakistan and other countries of the region.^{22,23,24,25,26,27}

As observed in the previous studies, all the parameters of metabolic syndrome were raised than normal as evident by the mean± SD of the overall patients included in this study. Waist circumference of patients was 97.507±9.73 cm in males while 90.612±11.24 cm in females which is more than the normal waist circumference recommended for Asian population. Raza MH and Aggarwal also reported the same in their study of psoriatic patients.^{24,25}

In male patients mean±SD of FBS (6.224±0.88 mmol/lit), DBP (85.44±8.89 mm), SBP (126.27±14.81 mm), Tgs (1.61±0.14) and HDL (1.027±0.26) were higher than normal values. This is despite the facts that among 69 male patients, 34 patients (49.3%) were diabetic and 23 (33.33%) of were hypertensive and already taking their medication. Similarly in female patients mean±SD of FBS (6.21±0.85mmol/lit), DBP (82.58±6.69 mm), SBP (120.93±9.85 mm), Tgs (1.613±0.10 mmol/lit) and HDL (1.29±0.12 mmol/lit) were a bit raised than normal values despite the fact that out of 31 female patients in the study 18 (58%) were already diabetic and 4 (13%) were already hypertensive and taking their medication.²⁷ Same raised values of BP and lipid profiles were reported in study done in Pakistan recently published in 2021, by Raza MH involving 80 patients suffering from psoriasis.²⁴ Prevalence of an important co-morbidity, i.e. diabetes is however more in our study (52%) as compared to previous studies done with these patients.

We also analyzed the data to find any link between duration of psoriasis and the prevalence of MetS. No correlation was established as there no was statistical difference in the prevalence of MetS between patients having duration of disease less than 10 years as compared to patients suffering for more than 10 years from psoriasis. This correlation was mentioned by Nisa et al in their study conducted in 2010, however, no correlation between duration of disease and MetS was reported by studies done by Azfar NA and Raza NH recently done in Pakistan ^{24,25}.

The results of our study support the benefits of regular screening for parameters of MetS whenever a psoriasis patient visits his family physician, dermatologists, or general physician irrespective of their age or duration of the disease. This will be help full in reducing any risk of CV event in these patients. The high prevalence of these metabolic parameters, especially obesity and diabetes, also indicates a need to focus on patient education on healthy diet, exercise, and other lifestyle changes.

One of the major limitations of this study is the small sample size and shorter duration of studies. More studies with larger sample sizes and longer duration will be of great help for better management of patients suffering from psoriasis.

Conclusion

There is a high prevalence of MetS in psoriatic patients that can lead to high cardiovascular events. The most prevalent among these are obesity and diabetes. Hence the patients having psoriasis must be screened on a

yearly basis for these controllable risk factors to reduce incidence of CV morbidity and mortality.

The services of paramedic and office staff of the department in their help to note down and record the patient's history and required data is acknowledged.

Conflict of Interest: No

Acknowledgement: No

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