



Prevalence of Various Comorbidities in Patients with Palmoplantar Psoriasis in a Tertiary Care Hospital: A Case - Control Study

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ABSTRACT

Psoriasis is an autoimmune skin disorder that affects around 0.44–2.8% of the Indian population and 2 to 4% of the western population. It is associated with multiple comorbidities like psoriatic arthritis, diabetes mellitus (DM), obesity, cardiovascular disease (CVD), hypertension (HTN), hyperlipidaemia, inflammatory bowel disease (IBD), non-alcoholic fatty liver disease (NAFLD), and depression. This study was done with the aim to assess the prevalence of diabetes, hypertension, obesity, cerebrovascular disorders, and hyperlipidaemia in patients with Palmoplantar plaque psoriasis (PPPP) compared with controls. This case-control study was done at Viswabharathi medical college, Kurnool, Andhra Pradesh for 24 months from January 2021 to December 2022 in the department of

Dermatology on 100 patients (50 patients were cases having PPPP, 50 patients were controls). Patients aged 30-60 years, both males and females were included in the study. There is no significant difference in the mean age between the two groups. Most of the patients were females. There is a significant difference in the incidence of family history of psoriasis between cases and controls. Incidences of comorbidities like diabetes mellitus (DM), Hypertension (HTN), hyperlipidaemia, obesity, and arthritis were significantly more in cases compared to controls. PPPP, which is characterized by a mild degree of skin involvement, confers a high risk of various comorbidities. Hence early intervention in the form of primary prevention is the need of the hour.

KEYWORDS

Palmoplantar Psoriasis, Co-morbidities, Case-control study, Plaques, Prevalence and pattern.

INTRODUCTION

Psoriasis is an autoimmune skin disorder that affects around 0.44–2.8% of the Indian population.^[1] and 2 to 4% of the western population.^[2] It is associated with multiple comorbidities like psoriatic arthritis, diabetes mellitus (DM), obesity, cardiovascular disease (CVD), hypertension (HTN), hyperlipidaemia, inflammatory bowel disease (IBD), non-alcoholic fatty liver disease (NAFLD), and depression.^[3] In Palmoplantar plaque psoriasis (PPPP), there is predominant involvement of palms and soles with or without the involvement of other regions. Morphology varies from thick hyperkeratotic plaque to pustular lesions. The former one is called palmoplantar plaque psoriasis (PPPP), while the latter is called palmoplantar pustulosis.^[4] PPPP constitutes for around 12% of all cases of psoriasis.^[5] Some authors consider PPPP as a separate entity from psoriasis.^[6] PPPP is characterized by erythematous, scaly plaques over palms and soles, along with painful fissures over thick plaques.^[7] As palms and soles are involved, it causes difficulties in performing daily activities, ultimately impacting the quality of life. Some cases respond well to topical therapy while some need systemic therapy. Some of the triggers for PPPP include smoking, trauma, and irritants. Palmoplantar psoriasis commonly involves less than 5% of body surface area. Hyperkeratotic hand eczema is one of the main differential diagnoses for PPPP, and exact differentiation is not possible with histopathology also. There are many previous studies that showed an association between chronic plaque psoriasis and various comorbidities. But there are lacunae in the literature on the

association between various comorbidities with PPPP in Andhra Pradesh, India. So, this study was done with the objective of knowing the prevalence, pattern and association of various comorbidities with PPPP.

AIM

This study was done to assess the prevalence of diabetes, hypertension, obesity, cerebrovascular disorders and hyperlipidaemia in patients with PPPP when compared with controls.

MATERIALS AND METHODS

Study site: Viswabharathi medical college, Kurnool, Andhra Pradesh.

Duration: This case-control study was conducted for 24 months from January 2021 to December 2022 in the department of Dermatology on 100 patients.

Sample size calculation: The prevalence of psoriasis in India as per Okhandiaret al.^[8] was 1.02%.

Sample size is calculated as

$$N = Z^2PQ/N^2$$

Error: 2%

Confidence intervals: 95%

N came to be 97. 97 is the minimum sample size. So, we included 100 patients in our study.

Groups: The study included 2 groups:

50 patients were cases- diagnosed with PPPP clinically

50 patients were controls- patients with no PPPP.

Inclusion Criteria

- Patients aged 30-60 years, diagnosed to have PPPP clinically- inclusion criteria for cases
- Patients coming to the outpatient unit of the dermatology department who were not having PPPP- controls
- Males and females
- Patients who provided informed consent to participate in the study.

Exclusion Criteria

- Pregnant and lactating women
- Patients with incomplete data.
- Patients with acute severe liver, renal, cardiac issues which interrupt data collection.

Parameters Assessed

- Age

- Gender
- Family history of psoriasis.
- Prevalence of diabetes, HTN, hyperlipidaemia, and arthritis in each group

Definitions: Obesity was diagnosed as the World Health Organization’s guidelines, as shown below:

Figure 1 showing classification of obesity^[9]

Classification	BMI (kg/m ²)	Risk of comorbidities
Underweight	<18.5	Low (but risk of other clinical problems increased)
Normal range	18.5–24.9	Average
Overweight (preobese)	25.0–29.9	Mildly increased
Obese	≥30.0	
Class I	30.0–34.9	Moderate
Class II	35.0–39.9	Severe
Class III	≥40.0	Very severe

Diabetes diagnosis was done as per American Diabetes Association criteria—fasting blood glucose more than or equal to 126 mg/dL or 2 hours post-prandial glucose more than or equal to 200 mg/dL or patient who is already on treatment for diabetes.^[10] Hypertension is diagnosed as systolic BP ≥140 mmHg and/or diastolic BP ≥90 mmHg or the patient on treatment for hypertension^[11]

Hyperlipidaemia is diagnosed if there is any one of the below:

1. Triglycerides >150 mg/dl or
2. High-density lipoprotein (HDL) cholesterol below 40 mg/dl in men or below 50 mg/dl in women or
3. VLDL above 30 mg/dl or
4. Total cholesterol above 200mg/dl or patient is on treatment for hyperlipidaemia.

Arthritis was diagnosed clinically as per symptoms, signs and radiologically.

Statistical Analysis

Data analysis was done using Epi Info software version 7.2.5. The results were expressed as mean ± S.D, percentages. Chi-square, T- test and Z tests were used for the comparison of categorical, numerical parameters and proportions between two groups respectively and odds ratio was used to know the extent of association between comorbidities and PPPP. P value < 0.05 was considered significant.

Ethical Considerations

Ethical committee approval was taken before conducting the study. The informed consent form was taken from every patient who participated in the study.

Results: Age

The mean age of patients was 42.3±1.2 years in the case group and 42.5±2.2 years in the control group. There is no significant difference in the mean age of

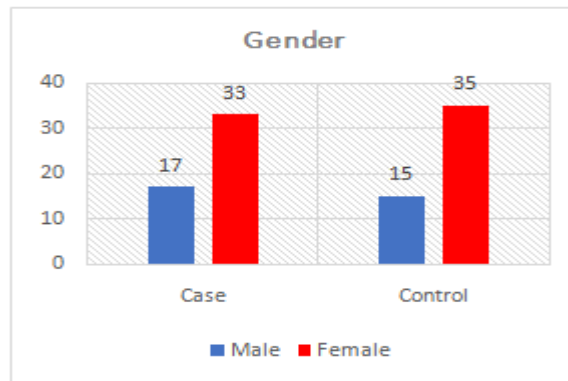
patients in the case and control group as per the T-test (p=0.57). Hence the comparison is justifiable without age-related bias.

Groups	Mean age	P value
Case	42.3±1.2	0.57
Control	42.5±2.2	T value-0.56

Table 1 shows mean age of patients in each group

Gender

Most of the patients (68%) were females.



Graph 1: Gender distribution in both groups.

Family History of Psoriasis

There is a significant difference in the incidence of positive family history of psoriasis between cases and

controls, as per chi-square analysis (p=-0.01).Family history of psoriasis is more commonly seen among cases compared to controls.

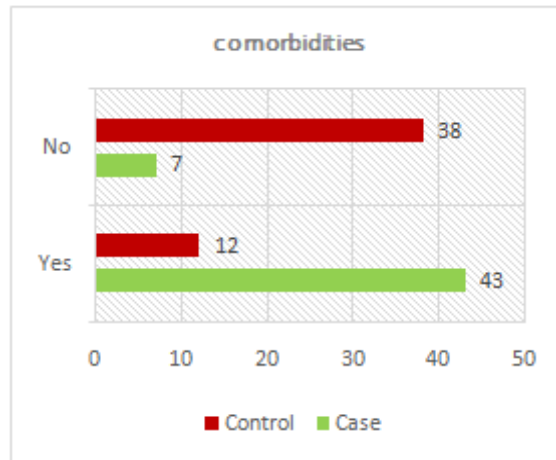
Group	Family history Yes	Family history No	P value
Case	22	28	0.0001
Control	2	48	Chi-square value=21.9

Table 2: Family history among cases and controls

Prevalence of Comorbidities

The overall prevalence of mentioned comorbidities (DM, HTN, Obesity, hyperlipidaemia and arthritis) among cases was 86% and among controls was 24%. The prevalence of comorbidities in the entire study

(100 patients) was 55%. There is a significant difference in the prevalence of comorbidities between cases and controls, as per Z test of proportions. (p=0.0001).



Graph 2: Comorbidities in each group

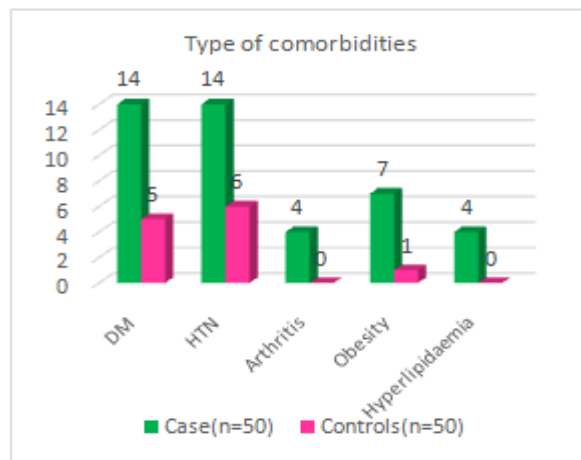
Pattern of Comorbidities

There is a significant difference in the incidence of diabetes, hypertension, psoriatic arthritis, hyperlipidaemia and obesity among cases and

controls as per chi square analysis. They are more commonly seen among cases compared to controls.

Comorbidity	Case(n=50)	Controls(n=50)	P value
DM	14	5	0.02
HTN	14	6	0.04
Psoriatic arthritis	4	0	0.04
Obesity	7	1	0.02
Hyperlipidaemia	4	0	0.041

Table 3: Pattern of comorbidities in each group



Graph 3: Types of comorbidities

Association of Comorbidities with PPPP

Diabetes was 3.5 times more common in patients with palmoplantar plaque psoriasis, Hypertension was 2.85 times more common, arthritis and hyperlipidaemia

were 9.7 times more common, obesity was 7.97 times more common in patients with PPPP compared to controls, as per odds ratio given below.

Comorbidity	Case	Controls	Odds ratio
DM	14	5	3.5
HTN	14	6	2.85
Psoriatic arthritis	4	0	9.77
Obesity	7	1	7.97
Hyperlipidaemia	4	0	9.77

Table 4: Association of comorbidities in each group

DISCUSSION

Literature on the association between psoriasis and other medical conditions is accumulating.^[12] Co-occurrence of psoriasis with other medical conditions may be due to overlapping disease pathologies.^[13-17]

Our study included 100 patients with and without PPPP. Comorbidities prevalence and types were compared between the groups.

There is no significant difference in the mean age of patients between cases and controls and most of the patients were females in our study. Odds of developing diabetes, hypertension, arthritis, obesity and hyperlipidaemia were more among cases compared to controls in our study.

In the study of Ran Greenbergetal.^[18] 163 patients with PPPP cases and 781 controls were included. The authors assessed comorbidities among cases and controls. There is no significant difference in the mean age of patients between both groups, and most of the patients were females, similar to our study. Diabetes mellitus (odds ratio [OR], 2.2), and mood disorders (OR, 6.232) is significantly associated with PPPP. Hyperlipidaemia, hypertension, and arthritis were more commonly seen among patients with palmoplantar plaque psoriasis, but there is no statistical significance.

In the study of Rathod et al^[19]the authors included 100 cases and 100 controls. There is no significant difference in the mean age similar to our study. Males were more commonly included in contrast to our study. Obesity, metabolic syndrome, diabetes mellitus, and hypertension were significantly more common among cases with PPPP compared to controls, similar to our study. The odds of diabetes, metabolic syndrome, obesity and hypertension in patients with PPPP were 4.8, 3.7, 3.5 and 3.1 respectively. In our study, the odds ratio was highest for arthritis and hyperlipidaemia.

In the study of Kim DH et al^[20]37 399 patients with PPP were included. They were compared with patients having pompholyx. The incidence of arthritis, ankylosing spondylitis, diabetes, Crohn's disease, and vitiligo were found to be more common among PPP patients.

The strength of this study was we assessed the pattern and prevalence of comorbidities among patients with PPPP. The main limitation is the small sample size.

There were no conflicts of interest.

CONCLUSION

In the current study, we tested the pattern and prevalence of comorbidities in patients with palmoplantar plaque psoriasis. Results proved that there was a significant association between various comorbidities and PPPP those were previously prevalent in patients with generalised psoriasis. PPPP, which is characterized by a mild degree of skin involvement, confers a high risk of various comorbidities. This may impact personal and occupational functioning and social interactions. Hence early intervention in the form of primary prevention is the need of the hour.

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