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Original Research Article

Prevalence and patterns of comorbidities in psoriasis: a cross-sectional study from Bangladesh

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ABSTRACT

Background: Psoriasis is a chronic inflammatory disorder marked by red, scaly patches on the skin, often causing itching. Psoriasis manifests in several forms, with plaque psoriasis being the most common. This condition affects the skin, nails, joints, and other systems, leading to significant comorbidities like cardiovascular and metabolic disorders. These comorbidities, seen in two-thirds of patients, highlight the systemic inflammatory nature of psoriasis. Understanding these associations is crucial for dermatologists to provide comprehensive care for affected individuals. The study aims to investigate the comorbidities associated with psoriasis.
Methods: This cross-sectional, observational study was conducted at the Department of Dermatology and Venereology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, including 120 adult psoriasis patients over one year. Ethical approval and informed consent were obtained.
Results: The most common age group was 41-50 years (30%), and the mean age of 43.63±13.69 years. Males comprised 60% of the population. Disease duration was up to 5 years for 80% of participants. Hypertension was the most frequent comorbidity (50%), followed by obesity (41.67%), dyslipidemia (33.33%), diabetes mellitus (25%), and metabolic syndrome (16.67%). Chronic plaque psoriasis was most prevalent (66.67%). Severity distribution indicated that 75% had mild/moderate psoriasis. Comparisons revealed no significant differences in comorbidities across psoriasis types or severity groups.
Conclusions: The study highlights the significant burden of comorbidities among psoriasis patients, particularly hypertension, obesity, dyslipidemia, diabetes mellitus, and metabolic syndrome. These conditions were prevalent regardless of psoriasis type or severity, underscoring the systemic nature of psoriasis and the need for comprehensive patient management.

Keywords: Psoriasis, Co-morbidities, Chronic inflammatory disorder

INTRODUCTION

Psoriasis is a chronic inflammatory disorder characterized by red, scaly patches, papules, or plaques on the skin, often accompanied by itching.[1] It is influenced by both genetic and environmental factors, which contribute to its variable course marked by episodes of remission and exacerbation.[2] Psoriasis affects individuals of all ages, with a worldwide prevalence of approximately 2% and around 125 million people globally.[3,4] In children under 18, the prevalence is about 0.71%.[5] Psoriasis manifests in multiple types, including plaque, guttate, inverse, pustular, and erythrodermic forms. Plaque psoriasis, the most common type, appears as sharply defined erythematous lesions covered with silvery white scales.[6] This condition affects not only the skin but also nails, joints, and other systemic regions, making it a disorder with complex and interconnected characteristics.[7] This disorder is frequently seen as a systemic condition because of its association with various comorbidities that impact the health of patients beyond their skin symptoms.[8]

Recent research highlights that psoriasis is often linked to systemic and inflammatory diseases, which have significant implications on patients' quality of life and increase their dependency on healthcare services. Notably, around two-thirds of psoriasis patients present with two or more comorbid conditions, significantly contributing to morbidity and mortality.[9] Frequently observed comorbidities in psoriasis patients include cardiovascular and metabolic disorders, such as obesity, diabetes, dyslipidemia, thyroid abnormalities, hypertension, mood disorders, and autoimmune diseases, highlighting the systemic inflammatory nature of psoriasis.[10,11] The chronic inflammatory nature of psoriasis predisposes individuals to other inflammatory conditions.[9] Studies suggest that these associations might arise from shared inflammatory pathways, with pro-inflammatory cytokines, such as tumor necrosis factor-alpha (TNF-α), being implicated in metabolic disorders like insulin resistance.[12]

Additionally, hypertension in psoriasis patients may relate to elevated levels of angiotensin-converting enzyme and endothelin-1 (ET-1), which contribute to cardiovascular risk.[13] Psoriatic arthritis (PsA) is a well-recognized comorbidity of psoriasis. However, more recently, research has begun to focus on the relationship between psoriasis and metabolic syndrome, a group of interconnected conditions that include abdominal obesity, atherogenic dyslipidemia, hypertension, insulin resistance, and hyperglycemia.[14,15]

Considering these complexities, dermatologists often serve as the initial healthcare providers for psoriasis patients and must be aware of these comorbidities to ensure optimal care.[16] Addressing the comorbidities associated with psoriasis can improve a patient's quality of life and may reduce health risks associated with untreated or undiagnosed concurrent conditions. The study aims to investigate the comorbidities associated with psoriasis.

METHODS

This was a cross-sectional, observational study conducted at the Department of Dermatology and Venereology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh from July 2023 to June 2024. A total of 120 adult patients, aged 18 years and above, with a clinical diagnosis of psoriasis, were included in the study. The study aims to evaluate the associated comorbid conditions among psoriasis patients attending the dermatology outpatient department (OPD). Ethical approval was obtained from the Institutional Review Board, and informed consent was obtained from all participants prior to inclusion.

Inclusion criteria

Patients aged >18 years; all clinical types of psoriasis, including plaque, pustular, palmoplantar, erythrodermic, and arthropathic forms; and patients willing to participate and provide informed consent were included.

Exclusion criteria

Patients currently on immunosuppressive drugs, such as systemic corticosteroids, methotrexate, or cyclophosphamide, for psoriasis or other chronic conditions; and pregnant and breastfeeding women were excluded.

Data were collected using a structured proforma sheet designed specifically for this study. Each participant underwent several assessment steps. First, a detailed medical history was recorded, encompassing demographic information, age of onset, duration of psoriasis, family history, and any comorbid conditions such as hypertension, diabetes mellitus, cardiovascular diseases, and mental health disorders. Second, a comprehensive general examination assessed overall health status and identified any signs of systemic involvement or additional comorbidities. Third, a thorough systemic examination was conducted to detect any internal organ involvement associated with psoriasis or related conditions. Fourth, a focused dermatological examination evaluated the type, severity, and extent of psoriasis lesions, classifying them into subtypes (plaque, pustular, palmoplantar, erythrodermic, and arthropathic) based on clinical presentation. Finally, relevant investigations were carried out to screen for comorbid conditions, including laboratory tests (e.g., blood sugar levels, lipid profile, renal and liver function tests) and imaging studies when clinically indicated. All findings from these examinations and investigations were systematically documented on the proforma sheet for subsequent analysis.

Data analysis

Collected data were entered into a statistical software package and analyzed to determine the prevalence of

psoriasis and associated comorbid conditions. Descriptive statistics (mean, standard deviation, frequency) were calculated for demographic and clinical characteristics. Chi-square tests or t-tests were employed as appropriate to assess the associations between psoriasis subtypes and comorbid conditions. A p value of <0.05 was considered statistically significant.

RESULTS

A total of 120 participants were included in the study, with ages ranging from 18 to over 60 years. The most common age group was 41-50 years (30%), followed by the 21-30 and 31-40 age groups, each comprising 20% of the population, respectively. The mean age was 43.63±13.69 years (Table 1).

Table 1: Age distribution of the study participants (n=120).

Age in years	Frequency (N)	Percentage (%)
18-20	2	1.67
21-30	24	20.00
31-40	24	20.00
41-50	36	30.00
51-60	12	10.00
>60	22	18.33
Mean±SD	43.63±13.69	

Males represented 60% of the study population, while females accounted for 40% (Table 2). The study found that 80% of participants had a disease duration of up to 5 years, while 20% had a duration exceeding 5 years (Figure 1).

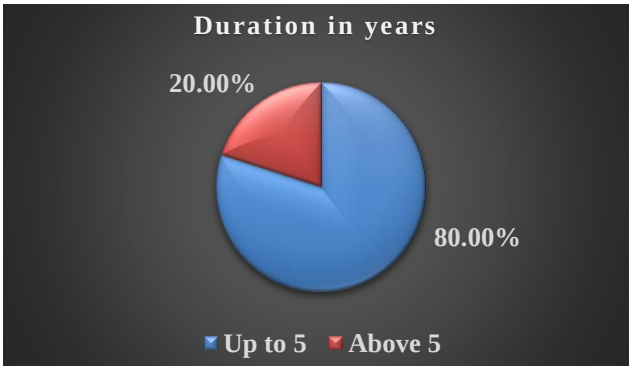

Figure 1: Disease duration in study participants with comorbidities.

Hypertension was the most common comorbidity, affecting 50% of participants, followed by obesity (41.67%), dyslipidemia (33.33%), diabetes mellitus (25%), and metabolic syndrome (16.67%) (Table 3). Chronic plaque psoriasis was the most prevalent type, affecting 66.67% of participants, while palmoplantar psoriasis was seen in 16.67%, and erythrodermic and pustular psoriasis each affected 8.33% of the study population (Table 4). Severity distribution showed that 75% of participants had mild or moderate psoriasis, while 25% had severe psoriasis (Figure 2).

Table 2: Sex distribution of the study participants (n=120).

Gender	Frequency (N)	Percentage (%)
Males	72	60.00
Females	48	40.00

Table 3: Distribution of the study population based on comorbidities.

Comorbidities	Frequency (N)	Percentage (%)
Hypertension	60	50.00
Obesity	50	41.67
Diabetes mellitus	30	25.00
Dyslipidemia	40	33.33
Metabolic syndrome	20	16.67

Table 4: Distribution of the study population based on psoriasis types.

Psoriasis types	Frequency (N)	Percentage (%)
Chronic plague	80	66.67
Palmoplantar psoriasis	20	16.67
Erythrodermic psoriasis	10	8.33
Pustular psoriasis	10	8.33

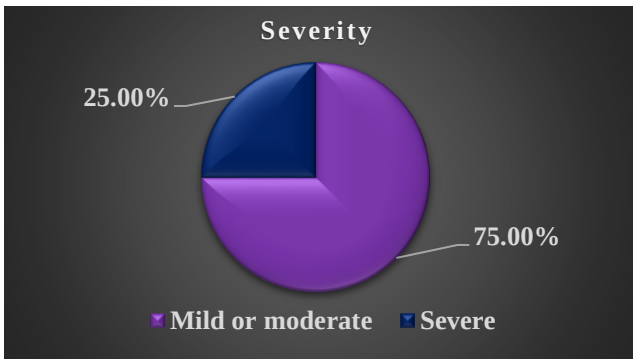

Figure 2: Distribution of the disease severity.

The comparison of metabolic and comorbid conditions across psoriasis types revealed no significant differences. Hypertension was observed in 50% of participants across all psoriasis types where (p=0.999). Obesity was most common in chronic plaque psoriasis (43.8%), followed by palmoplantar (40%), erythrodermic (40%), and pustular psoriasis (30%). Diabetes mellitus was seen in 25% of those with chronic plaque and palmoplantar psoriasis, 30% of those with erythrodermic psoriasis, and 20% of pustular psoriasis cases. Dyslipidemia was most prevalent in chronic plaque and palmoplantar psoriasis (35%) and less

common in erythrodermic (30%) and pustular psoriasis (20%). Metabolic syndrome was least common in pustular psoriasis (10%) (Table 5). The comparison between mild/moderate and severe psoriasis showed no significant differences in comorbidities. Hypertension affected 50% of participants in both groups. Obesity was more common in the severe group (50%) compared to the mild/moderate group (42.2%) (p=0.443). Diabetes mellitus was observed in 33.3% of the severe group and 22.2% of the mild/moderate group (p=0.225). Dyslipidemia and metabolic syndrome were equally prevalent in both groups, at 33.3% and 16.7%, respectively with p value 1 (Table 6).

Table 5: Comparison of comorbidities with different types of psoriasis.

Variables	Chronic plaque (n=80)		Palmoplantar psoriasis (n=20)		Erythrodermic psoriasis (n=10)		Pustular psoriasis (n=10)		P value
	N	%	N	%	N	%	N	%	
Hypertension	40	50	10	50	5	50	5	50	0.999
Obesity	35	43.8	8	40	4	40	3	30	0.856
Diabetes mellitus	20	25	5	25	3	30	2	20	0.934
Dyslipidemia	28	35	7	35	3	30	2	20	0.761
Metabolic syndrome	15	18.8	4	20	2	20	1	10	0.891

Table 6: Comparison of comorbidities with psoriasis severity.

Variables	Mild or moderate (n=90)		Severe (n=30)		P value
	N	%	N	%	
Hypertension	45	50	15	50	1
Obesity	38	42.2	15	50	0.443
Diabetes mellitus	20	22.2	10	33.3	0.225
Dyslipidemia	30	33.3	10	33.3	1
Metabolic syndrome	15	16.7	5	16.7	1

DISCUSSION

In the present era, psoriasis has become a significant skin condition linked to various comorbidities, which contribute to increased morbidity and mortality. The chronic inflammatory nature of psoriasis is a key factor in the development of these comorbidities, with tumor necrosis factor (TNF) alpha playing a central role. Numerous studies have highlighted this association in psoriasis. This study was designed to explore the relationship between common clinical types of psoriasis and comorbidities in relation to both the duration and severity of the condition. In our study, the mean age of patients with comorbidities was 43.63±13.69 years, which closely aligns with the findings of Aftab et al, where the mean age was 41.94±11.60 years.[17] Our study also showed that 60% of the patients were male, a result that is consistent with similar research. Gisondi et al. reported that 66.6% of males and 75% of females had comorbidities, indicating that both genders were affected by these conditions.[18] The duration of psoriasis with comorbidities varied widely in our study. We found that 80% of patients had a disease duration of less than 5 years, while 20% had a duration of more than 5 years. These findings are in line with those of Jarang et al, who reported that 69.6% of patients had a disease duration of less than 5 years, with 30.4% experiencing a longer duration.[19] In our study, 120 patients had various comorbidities, with hypertension being the most common, affecting 50% of participants. This was followed by obesity (41.67%), dyslipidemia (33.33%), diabetes mellitus (25%), and metabolic syndrome (16.67%). These results are consistent with previous studies, where major comorbidities included hypertension, obesity, diabetes mellitus, dyslipidemia, and metabolic syndrome.[20-25] The most common type of psoriasis in our study was chronic plaque (66.67%), followed by palmoplantar (16.67%), erythrodermic (8.33%), and pustular (8.33%). This is similar to the findings of Rasool et al, where chronic plaque psoriasis was the most prevalent type (39%), followed by palmoplantar (25%), scalp (21%), erythrodermic (10%), and pustular (5%) psoriasis.[16] In our study, 75% of patients had mild to moderate disease, while 25% had severe disease. Interestingly, a slightly higher proportion of patients with comorbidities had severe disease (68% with mild/moderate disease versus 76% with severe disease), though this difference was not statistically significant (p=0.5809). This suggests that comorbidities can occur in psoriasis regardless of its severity, as also observed in a study by Niemann et al.[26] When comparing metabolic and comorbid conditions across psoriasis types, no statistically significant differences in the prevalence of these conditions were found among the groups. Hypertension was consistently observed in 50% of participants across all psoriasis types. Obesity was most common in chronic plaque psoriasis, with a slightly lower prevalence in palmoplantar, erythrodermic, and pustular psoriasis. Diabetes mellitus was found in 25% of individuals with chronic plaque and palmoplantar psoriasis, slightly higher in erythrodermic psoriasis (30%) and lower in pustular psoriasis (20%). Dyslipidemia followed a similar pattern, being most prevalent in chronic plaque and palmoplantar

psoriasis compared to erythrodermic and pustular psoriasis. Metabolic syndrome was least prevalent in pustular psoriasis (10%) and slightly higher in the other groups, but no significant differences were observed among psoriasis types. Rasool et al. reported that all five comorbidities, hypertension, obesity, diabetes mellitus, dyslipidemia, and metabolic syndrome, were present in chronic plaque, scalp, and erythrodermic psoriasis, while pustular psoriasis was associated with only dyslipidemia and obesity. Scalp psoriasis patients had comorbidities in the following order: dyslipidemia, diabetes mellitus, hypertension, obesity, and metabolic syndrome, whereas erythrodermic psoriasis patients primarily had dyslipidemia and obesity, each with a 15% comorbidity rate. These findings further support the notion that comorbidities can occur across all types of psoriasis, with dyslipidemia being the most common comorbidity in palmoplantar psoriasis, followed by hypertension.[16] A comparison of metabolic and comorbid conditions between the mild/moderate and severe psoriasis groups in our study revealed no statistically significant differences across the variables. Hypertension was equally prevalent in both groups, affecting 50% of participants. Obesity was slightly more common in the severe psoriasis group, while diabetes mellitus was observed in 33.3% of the severe group compared to 22.2% in the mild/moderate group. Dyslipidemia and metabolic syndrome had identical prevalence rates in both groups, at 33.3% and 16.7%, respectively. In previous studies, diabetes mellitus was found in approximately 45.3% of psoriasis cases, while hypertension was observed in 17.95%, obesity in 24.79%, ischemic heart disease in 53%, and dyslipidemia in 19%. Thomas et al reported that 55.8% of psoriasis patients had at least one comorbid condition, with an Indian study by the same authors showing that 52% of patients had at least one comorbidity. In a study by Kumar et al, 88.5% of psoriasis patients had one or more comorbid conditions, including obesity (22.5%), diabetes (49%), and hypertension (12.5%). Psoriasis has also been linked to an increased risk of cardiovascular disease, with a 56% rise in ischemic heart disease rates.[27-30]

Limitations

This study on psoriasis and related comorbid conditions has several limitations.

The sample size of 120 patients is relatively small, potentially affecting the generalizability of the findings. Additionally, the exclusion of patients on immunosuppressive drugs and pregnant or breastfeeding women may have led to an underestimation of the prevalence and impact of comorbid conditions.

CONCLUSION

In conclusion, our study underscores the significant burden of comorbidities among psoriasis patients, highlighting the systemic nature of this chronic inflammatory condition. Hypertension, obesity, dyslipidemia, diabetes mellitus, and metabolic syndrome were prevalent, with hypertension being the most common comorbidity. The distribution of these conditions did not significantly differ across various types and severities of psoriasis, indicating that comorbidities can occur irrespective of psoriasis subtype or severity. These findings emphasize the necessity for comprehensive management strategies that address both the dermatological and systemic aspects of psoriasis, ultimately aiming to improve patient outcomes and quality of life.

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