



# Clinico Histopathological Study of Palmoplantar Psoriasis and Palmoplantar Eczema

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## KEYWORDS

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Histopathology;  
Clinicopathological correlation;  
Parakeratosis;  
Spongiosis;  
Hyperkeratotic lesions;  
Dermatopathology.

## ABSTRACT:

**Background:** Palmoplantar psoriasis (PPP) and palmoplantar eczema (PPE) are common inflammatory dermatoses affecting the palms and soles. Due to overlapping clinical and histopathological features, differentiating between these two conditions is often challenging, yet essential, as management strategies and prognosis differ significantly.

**Objectives:** To evaluate and compare the clinical features of palmoplantar psoriasis and palmoplantar eczema and to correlate these findings with their histopathological characteristics.

**Materials and Methods:** This cross-sectional study was conducted over a period of 18 months in the Department of Dermatology, Integral Institute of Medical Sciences and Research, Lucknow. A total of 88 clinically suspected cases of palmoplantar psoriasis and palmoplantar eczema were included. Detailed clinical evaluation was performed, followed by histopathological examination of representative skin biopsies. Data were analyzed using the Chi-square test and Fisher's exact test, with  $p < 0.05$  considered statistically significant.

**Results:** Of the 88 subjects, 60.2% were clinically diagnosed as palmoplantar eczema and 39.8% as palmoplantar psoriasis. The mean age was  $36.6 \pm 11.5$  years, with a female predominance (72.7%). Itching was the most common presenting complaint (65.9%). Clinicopathological discordance was observed in a subset of cases, with 10.2% of clinically diagnosed psoriasis cases proving to be eczema and 6.8% vice versa. Statistically significant differences ( $p < 0.001$ ) were noted in both clinical symptoms and histopathological features. Palmoplantar psoriasis showed confluent parakeratosis, hypogranulosis, neutrophilic infiltration, suprapapillary thinning, elongated rete ridges, and minimal spongiosis, whereas palmoplantar eczema was characterized by focal parakeratosis, marked spongiosis, fibrin globules, regular acanthosis, and lymphocytic infiltrate. Correlation between clinical and histopathological diagnosis was weak ( $r = 0.098$ ).

**Conclusion:** Palmoplantar psoriasis and palmoplantar eczema show considerable clinical overlap, making exclusive clinical diagnosis unreliable. Histopathological examination plays a crucial role in accurate differentiation and should be considered mandatory in ambiguous or treatment-resistant cases to ensure appropriate management and improved patient outcomes.

## Introduction

The palms and soles consist of specialized glabrous skin with unique dermatoglyphics and are frequently affected by dermatoses that may cause significant functional impairment, particularly in individuals engaged in manual labor.<sup>1</sup> Several dermatological conditions involve these sites, some exclusively, and subtle clinical differences necessitate careful evaluation for accurate diagnosis.<sup>1</sup>

Psoriasis is a chronic immune-mediated inflammatory dermatosis affecting 2–5% of the population, characterized by well-demarcated erythematous plaques with silvery scales.<sup>2</sup> Palmoplantar psoriasis (PPP), accounting for 3–4% of psoriasis cases, is a localized variant involving the palms and soles.<sup>2</sup> It may present as hyperkeratotic plaques, pustular lesions, or mixed morphology, typically with symmetrical distribution.<sup>2,3</sup>

Although palmoplantar involvement usually affects <5% body surface area (BSA), it is associated with marked impairment in quality of life due to pain, fissuring, pruritus, and functional limitation.<sup>4,5</sup> PPP is often resistant to conventional therapy, though biologics have shown promising results.<sup>4,5</sup> Genetic predisposition, particularly HLA-Cw6, along with environmental triggers such as smoking, friction, and detergents, contribute to its pathogenesis.<sup>4,5</sup> Oxidative stress imbalance has also been implicated.<sup>6</sup> Histopathologically, PPP demonstrates regular acanthosis, parakeratosis, diminished granular layer, suprapapillary thinning, and neutrophilic collections such as Munro's microabscesses and spongiform pustules of Kogoj.<sup>2</sup>

Eczema of the hands and feet encompasses inflammatory dermatoses arising from exogenous (irritant and allergic contact



dermatitis) or endogenous causes (atopic dermatitis, pompholyx, hyperkeratotic eczema).<sup>1</sup> Palmoplantar eczema (PPE) commonly presents with pruritus, vesiculation, fissuring, and lichenification.<sup>8</sup> Histopathological features include spongiosis, acanthosis, hyperkeratosis, and dermal inflammatory infiltrates.<sup>8</sup>

PPP and PPE frequently exhibit overlapping clinical and histopathological features, including epidermal hyperplasia and parakeratosis, making differentiation challenging.<sup>2,8</sup> Although findings such as Munro's microabscesses favor psoriasis, histopathology may be inconclusive in certain cases.<sup>8</sup> Limited focused studies comparing these entities have contributed to diagnostic ambiguity. Therefore, the present study was undertaken to evaluate and compare the histopathological features of palmoplantar psoriasis and palmoplantar eczema to improve diagnostic accuracy and guide appropriate management.

### Rationale

Palmoplantar psoriasis and palmoplantar eczema exhibit considerable clinical overlap, often leading to diagnostic uncertainty. Given that treatment modalities and prognostic outcomes differ between these conditions, accurate differentiation is essential. Histopathological examination plays a pivotal role in establishing diagnosis, especially in clinically ambiguous cases. This study was undertaken to systematically evaluate and compare the clinical and histopathological features of these two dermatoses to determine the diagnostic utility of histopathology in routine clinical practice.

### Materials and Methods

#### Study Design and Setting

This cross-sectional study was conducted in the Department of Dermatology at Integral Institute of Medical Sciences and Research, Lucknow, over a period of 18 months.

#### Study Population

The study population comprised patients attending the Dermatology Outpatient Department (OPD) who were clinically suspected to have palmoplantar psoriasis or palmoplantar eczema. All eligible participants fulfilling the inclusion criteria were recruited consecutively during the study period.

#### Inclusion Criteria

1. Male and female patients fulfilling the clinical criteria for palmoplantar psoriasis or palmoplantar eczema.
2. Patients aged between 18 and 60 years.
3. Patients presenting with palmoplantar dermatoses in whom a definitive clinical diagnosis of either palmoplantar psoriasis or palmoplantar eczema could not be established and who were receiving conservative treatment.

#### Exclusion Criteria

1. All other palmoplantar dermatoses excluding palmoplantar psoriasis and palmoplantar eczema.
2. Patients unwilling to provide written informed consent.
3. Previously diagnosed cases of palmoplantar psoriasis or palmoplantar eczema already receiving treatment.

#### Methodology

Patients attending the Dermatology OPD who fulfilled the inclusion criteria were enrolled after obtaining written informed consent. A detailed clinical history was recorded, and a thorough dermatological examination was performed in all cases.

The most representative lesion from each patient was selected for biopsy. Skin biopsy specimens were obtained under aseptic precautions and sent for histopathological examination. The histopathological findings were analyzed and correlated with the clinical diagnosis.

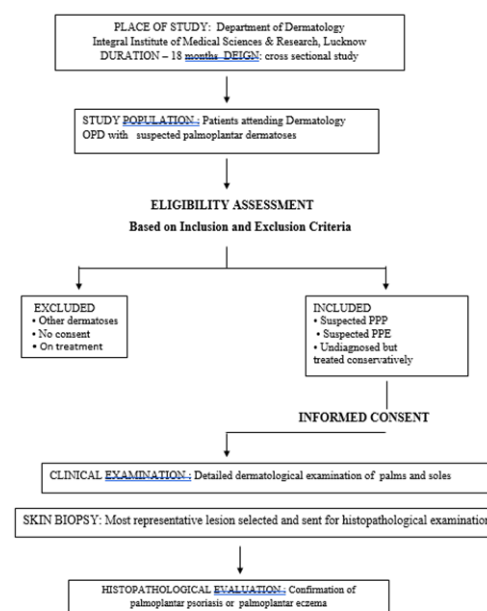
#### Statistical Analysis

Data were compiled and analyzed using appropriate statistical methods. Categorical variables were expressed as frequencies and percentages. The Chi-square test and Fisher's exact test were applied to assess the association between clinical and histopathological variables. A p-value of <0.05 was considered statistically significant.

#### Study Duration

The total duration of the study was 18 months.

#### STUDY PROTOCOL



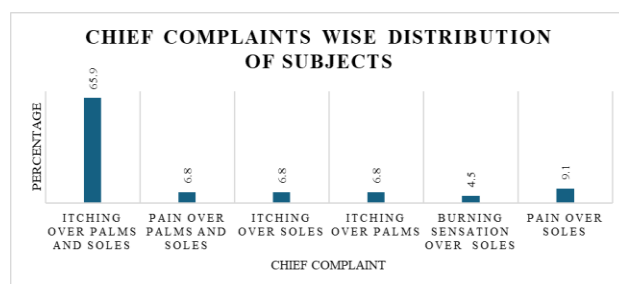


## RESULTS:

A total of 88 participants were included in the study. The majority belonged to the 21–40 years age group (62.5%). Females predominated in the study population (72.7%). The mean age of participants was  $36.6 \pm 11.5$  years, indicating a predominantly middle-aged female population.

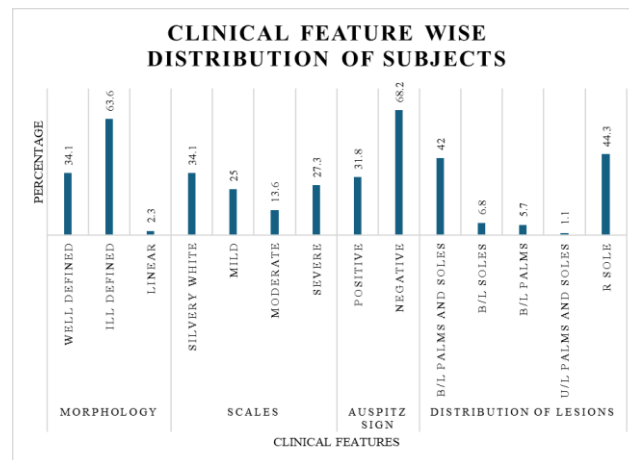
Variable	Category	Number (n)	Percentage (%)
Age Group (Years)	18–20	6	6.8
	21–40	55	62.5
	41–60	22	25.0
	60–66	5	5.7
	<b>Total</b>	<b>88</b>	<b>100</b>
Mean Age $\pm$ SD		<b>36.6 <math>\pm</math> 11.5 years</b>	
Gender	Male	24	27.3
	Female	64	72.7
	<b>Total</b>	<b>88</b>	<b>100</b>

**Graph 1. Chief complaints wise distribution of subjects.**



Among the 88 participants, the most common presenting complaint was itching over both palms and soles, reported by 58 subjects (65.9%). Complaints such as pain over palms and soles, itching over soles, and itching over palms were each noted in 6 subjects (6.8%). Burning sensation over soles was reported by 4 subjects (4.5%), while pain over soles occurred in 8 subjects (9.1%). Overall, itching-related symptoms were the predominant clinical presentation in this study population.

**Graph 2. Clinical features wise distribution of subjects.**



Among all 88 participants, ill-defined lesions were the most common morphology, observed in 56 subjects (63.6%), followed by well-defined lesions in 30 subjects (34.1%). Only 2 participants (2.3%) presented with linear lesions. With regard to scaling, silvery white scales were the most frequent pattern, noted in 30 subjects (34.1%), followed by severe scaling in 24 subjects (27.3%). Mild and moderate scaling were observed in 22 (25.0%) and 12 (13.6%) subjects, respectively. The Auspitz sign was positive in 28 subjects (31.8%), while the majority, 60 subjects (68.2%), tested negative. Regarding the distribution of lesions, bilateral involvement of palms and soles was seen in 37 subjects (42.0%), whereas unilateral involvement of the right sole was observed in 39 subjects (44.3%). Smaller proportions showed bilateral soles involvement in 6 subjects (6.8%), bilateral palms involvement in 5 subjects (5.7%), and unilateral palms-and-soles involvement in 1 subject (1.1%).

**Table 2. Clinicopathological Correlation and Laterality of Lesions.**

Parameter	Category	Palmoplantar Eczema (n=56)	Palmoplantar Psoriasis (n=32)	Total (n=88)	p-value
Clinicopathological Correlation					



Histopathology: PPE	Clinical ly PPE	47 (53.4%)	—	47	
	Clinical ly PPP	9 (10.2%)	—	9	
	<b>Total PPE (Histopathology)</b>	<b>56 (60.2%)</b>			
Histopathology: PPP	Clinical ly PPE	—	6 (6.8%)	6	
	Clinical ly PPP	—	26 (29.6%)	26	
	<b>Total PPP (Histopathology)</b>		<b>32 (39.8%)</b>		
<b>Overall Concordance</b>				<b>73 (83.0%)</b>	
<b>Overall Discordance</b>				<b>15 (17.0%)</b>	
<b>Laterality of Lesions</b>					<b>&lt;0.001*</b>
	Unilateral	50 (89.3%)	5 (15.6%)	55	
	Bilateral	6 (10.7%)	27 (84.4%)	33	

Clinicopathological correlation demonstrated that 56 cases (60.2%) were diagnosed as palmoplantar eczema and 32 cases (39.8%) as palmoplantar psoriasis on histopathology. Overall concordance between clinical and histopathological diagnosis was observed in 73 cases (83.0%), while discordance occurred in 15 cases (17.0%).

A statistically significant difference was observed in lesion laterality between the two groups ( $p < 0.001$ ). Palmoplantar psoriasis predominantly exhibited bilateral involvement (84.4%), whereas palmoplantar eczema showed a marked unilateral distribution (89.3%).

**TABLE 3. Symptom wise distribution of both groups.**

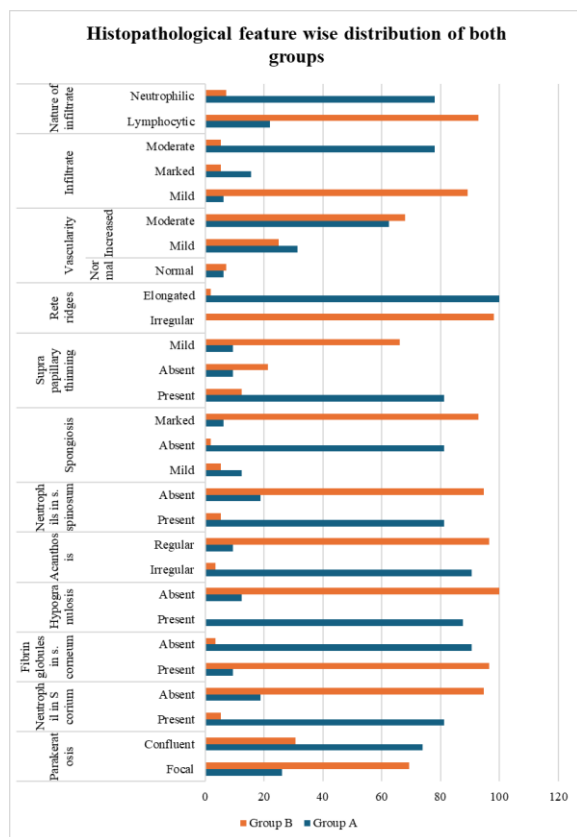
Sr. No.	Symptoms	Group A n (%)	Group B n (%)	p Value		
1	Itching	Mild	4 (12.5%)	23 (41.1%)	<0.001*	
		Moderate	2 (6.3%)	31 (55.4%)		
		Absent	26 (81.3%)	2 (3.6%)		
2	Fissuring	Present	5 (15.6%)	50 (89.3%)	<0.001*	
		Absent	27 (84.4%)	6 (10.7%)		
3	Pain	Mild	8 (25.0%)	11 (19.6%)	<0.001*	
		Moderate	3 (9.4%)	45 (80.4%)		
		Absent	20 (62.5%)	0 (0%)		
4	Burning Sensation	Absent	6 (18.8%)	42 (75.0%)	<0.001*	
		Present	Mild	15 (46.9%)		8 (14.3%)
			Moderate	11 (34.3%)		6 (10.7%)

\* Where group A- palmoplantar psoriasis cases and group B- palmoplantar eczema cases.

There were marked differences in symptom distribution between the two groups. Itching was significantly more severe in Group B (palmoplantar eczema), with moderate itching observed in 55.4% and mild itching in 41.1% of subjects, whereas itching was absent in the majority of Group A (81.3%). Fissuring showed a striking contrast, being present in only 15.6% of Group A but in as many as 89.3% of Group B, indicating greater skin barrier disruption in eczema cases. Pain severity also differed significantly between the groups; in Group A, 62.5% had no pain, while mild and moderate pain were reported in 25.0% and 9.4% respectively, whereas moderate pain was predominant in Group B (80.4%), with no participants reporting absence of pain. With regard to burning sensation, absence of burning was noted in the majority of Group B subjects (75.0%), while mild and moderate burning were more frequent in Group A (46.9% and 34.3% respectively). Overall, itching, fissuring, pain, and burning sensation demonstrated statistically significant differences between palmoplantar psoriasis and palmoplantar eczema ( $p < 0.001$ ), highlighting distinct clinical symptom profiles between the two conditions.



GRAPH 3: Histopathological feature



A clear and statistically significant distinction in histopathological features was observed between Group A (palmoplantar psoriasis) and Group B (palmoplantar eczema) ( $p < 0.001$  for all parameters). With respect to parakeratosis, confluent parakeratosis was significantly more common in Group A (73.9%), whereas focal parakeratosis predominated in Group B (69.2%), highlighting a key differentiating feature between the two groups. Neutrophils in the stratum corneum were present in a significantly higher proportion of Group A cases (81.3%) compared to Group B (5.4%), where absence of neutrophils was observed in the majority (94.6%).

In contrast, fibrin globules in the stratum corneum were rarely seen in Group A (9.4%) but were markedly prevalent in Group B (96.4%), making this a characteristic feature of palmoplantar eczema. Hypogranulosis was another defining feature of Group A, present in 87.5% of cases and completely absent in Group B. Acanthosis demonstrated contrasting patterns, with irregular acanthosis predominantly seen in Group A (90.6%), while regular acanthosis was observed in most Group B cases (96.4%).

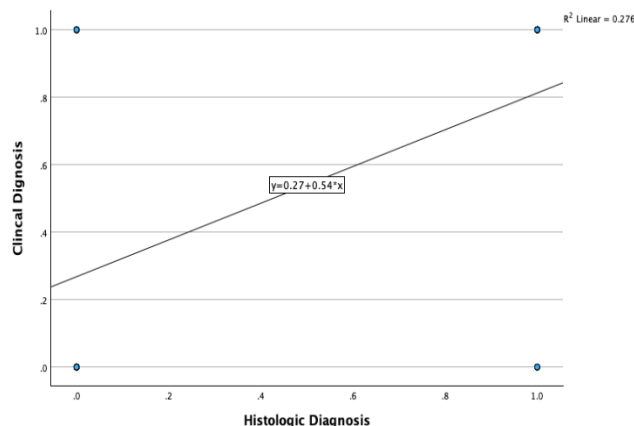
Similarly, neutrophils in the stratum spinosum were significantly more frequent in Group A (81.3%)

compared to Group B (5.4%). Spongiosis showed a striking difference between the two groups; marked spongiosis was observed in 92.9% of Group B cases, whereas the majority of Group A cases (81.3%) showed absence of spongiosis, with only 12.5% showing mild spongiosis. Suprapapillary thinning was predominantly present in Group A (81.3%), while mild suprapapillary thinning was more commonly seen in Group B (66.1%).

Regarding rete ridges, regular elongation was noted in all Group A cases (100%), whereas irregular rete ridges predominated in Group B (98.2%). Vasculature was increased in both groups; however, moderate increased vasculature was significantly more common in Group A (62.5%), while Group B showed a similar predominance of moderate increased vasculature (67.9%), with only a small proportion in both groups showing normal vasculature.

Analysis of the inflammatory infiltrate revealed that moderate infiltrate was most common in Group A (78.1%), whereas mild infiltrate predominated in Group B (89.3%). Furthermore, the nature of infiltrate differed significantly, with neutrophilic infiltrate being more frequent in Group A (78.1%), while lymphocytic infiltrate was the predominant pattern in Group B (92.9%).

Graph 4. Correlation between clinical diagnosis and histopathological diagnosis.



The correlation analysis showed a weak positive correlation ( $r = 0.098$ ) between clinical diagnosis and histopathological diagnosis. This indicates that clinical diagnosis alone has poor agreement with histopathological findings, suggesting that reliance solely on clinical assessment may lead to diagnostic inaccuracies. Therefore, histopathology remains essential for accurate differentiation between palmoplantar eczema and psoriasis.



## DISCUSSION:

Palmoplantar psoriasis (PPP) is a localized variant of psoriasis that frequently presents with overlapping clinical and histopathological features with palmoplantar eczema (PPE), leading to diagnostic challenges and therapeutic implications.<sup>9</sup> Accurate differentiation is essential, as the natural history, recurrence pattern, and management strategies differ between these conditions.<sup>10</sup> The present cross-sectional study was conducted to evaluate clinical features of PPP and PPE and to correlate them with histopathological findings.

### Demographic Characteristics

In the present study, the majority of patients belonged to the 21–40 years age group (62.5%), with a mean age of  $36.6 \pm 11.5$  years, indicating predominance in young to middle-aged adults. This finding is consistent with previous studies reporting peak incidence during the second to fourth decades of life.<sup>10</sup> Psoriasis is known to affect all age groups but commonly manifests in early adulthood.

A female predominance (72.7%) was observed in the present study. Similar female preponderance has been reported by Jahnavi Chaduvula et al.<sup>11</sup> and in studies by Gutte and Khopkar, Sánchez-Pérez et al.,<sup>12</sup> and Mugoni et al.<sup>13</sup>

### Clinical Characteristics

Itching was the most common presenting complaint (65.9%), particularly pronounced in PPE. Agarwal et al.<sup>10</sup> reported itching in 85.42% of hyperkeratotic eczema cases, supporting our findings. Similarly, Anandan Venkatesan et al.<sup>15</sup> noted irritation, fissuring, and difficulty in walking as common symptoms.

Lesion morphology in the present study was predominantly ill-defined (63.6%), and bilateral involvement was common overall. However, when groups were analyzed separately, bilateral symmetrical involvement was significantly associated with PPP, whereas unilateral involvement was characteristic of PPE ( $p < 0.001$ ). Agarwal et al.<sup>10</sup> similarly reported predominant bilateral symmetry in palmar and plantar psoriasis. Das et al.<sup>16</sup> and Khandpur et al.<sup>17</sup> also observed frequent involvement of both palms and soles in psoriasis.

Auspitz sign was positive in only 31.8% of cases, reinforcing that classical signs are not universally present, particularly in partially treated cases.<sup>17</sup>

### Clinicohistopathological Correlation

Histopathology confirmed PPE in 60.2% and PPP in 39.8% of cases. Overall clinicopathological concordance was 83.0%, with 17.0% discordance. Comparable

clinico-histopathological correlation has been reported by Das et al.<sup>16</sup> (88.5%), Pandit et al.<sup>18</sup> (95.24%), and Mehta et al.<sup>19</sup> (72.4%). However, overlap between PPP and PPE remains significant when relying solely on clinical diagnosis.

The weak correlation coefficient ( $r = 0.098$ ) in the present study indicates poor agreement between clinical and histopathological diagnosis, supporting findings by Sen et al.,<sup>20</sup> who reported frequent clinical misclassification of hyperkeratotic eczema as psoriasis.

### Symptom Comparison Between Groups

Statistically significant differences were observed in itching, fissuring, pain, and burning sensation ( $p < 0.001$ ). PPE demonstrated more severe itching, fissuring, and pain, whereas burning sensation was more frequently reported in PPP. Similar symptom profiles have been described by Jahnavi Chaduvula et al.,<sup>11</sup> Vijay Sekhar et al.,<sup>21</sup> and Kumar et al.<sup>22</sup>

### Histopathological Differentiation

Highly significant histopathological differences ( $p < 0.001$ ) were observed between PPP and PPE.

#### PPP was characterized by:

- Confluent parakeratosis
- Hypogranulosis
- Neutrophils in stratum corneum and spinosum
- Suprapapillary thinning
- Elongated rete ridges
- Increased vascularity
- Predominantly neutrophilic infiltrate

These findings are consistent with classical psoriatic histology described by Agarwal et al.,<sup>10</sup> Kamyab-Hesari et al.,<sup>23</sup> and Rao et al.<sup>24</sup>

#### In contrast, PPE showed:

- Focal parakeratosis
- Marked spongiosis
- Fibrin globules in stratum corneum
- Regular acanthosis
- Predominantly lymphocytic infiltrate

These distinct epidermal and dermal patterns confirm that histopathology remains the most reliable diagnostic modality in clinically overlapping cases.

### Overall Interpretation

The present study demonstrates significant clinical overlap between palmoplantar psoriasis and palmoplantar eczema. Although certain features such as



bilateral symmetry, severe itching, and fissuring may provide diagnostic clues, they are insufficient for definitive diagnosis. The weak clinicopathological correlation ( $r = 0.098$ ) underscores the limitations of clinical assessment alone.

Thus, histopathological examination plays a crucial role in accurate differentiation and should be routinely considered in atypical, unilateral, treatment-resistant, or clinically ambiguous palmoplantar dermatoses.

### Strengths and Limitations of the Study

The present study has several strengths, including its focused clinicohistopathological comparison of palmoplantar psoriasis and palmoplantar eczema, a common yet challenging diagnostic dilemma in dermatological practice. Histopathological confirmation in all cases enhanced diagnostic reliability and reduced sole dependence on clinical assessment. The systematic evaluation of both clinical features and specific microscopic parameters, supported by statistical analysis, strengthened the validity of the observed associations. However, certain limitations must be acknowledged. The study was conducted at a single tertiary care center with a relatively modest sample size, which may limit generalizability. Its cross-sectional design precluded assessment of long-term outcomes and treatment response. Additionally, interobserver variability in histopathological interpretation and the potential influence of prior treatment on tissue morphology were not formally evaluated.

### Conclusion

Palmoplantar psoriasis and palmoplantar eczema exhibit considerable clinical overlap, often making diagnosis based solely on clinical features unreliable. Although certain symptoms such as bilateral symmetry favor psoriasis and intense itching with fissuring favors eczema, these findings are not definitive. Histopathological examination remains the gold standard for accurate differentiation, particularly in atypical or treatment-resistant cases. Early and precise diagnosis is essential for guiding appropriate management and improving patient outcomes.

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