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Histomorphological Differentiation Between Psoriasis and Psoriasiform Dermatoses: A Comparative Study

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ABSTRACT

Introduction: Psoriasis is a common chronic immune-mediated skin disease which frequently mimic with psoriasiform dermatoses clinically and histologically. However, distinguishing them based on micromorphological features is essential for accurate diagnosis and treatment. Histopathology is considered as gold standard for diagnosis but some time it's confusing and inconclusive.

Aim: To differentiate psoriasis from psoriasiform dermatoses using specific histopathological features on routine haematoxylin and eosin (H&E) stained sections.

Materials and Methods: A total of 60 skin biopsies, including 30 each of psoriasis and psoriasiform dermatoses, were analysed. Key epidermal and dermal features were graded and statistically compared.

Results: Psoriasis showed characteristic confluent parakeratosis, regular acanthosis, suprapapillary thinning, and Munro micro abscesses on other side Psoriasiform dermatoses showed variable hyperkeratosis, irregular acanthosis, and minimal neutrophilic infiltration. These distinctions were statistically significant.

Conclusion: Routine histopathology provides reliable criteria to differentiate psoriasis from psoriasiform dermatoses, aiding in accurate diagnosis when clinical overlap occurs.

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INTRODUCTION

Psoriasis is a chronic, immune-mediated dermatological condition, affecting approximately 2–3% of the global population [1].

It presents with sharply demarcated, erythematous plaques with silvery scales, most commonly over extensor surfaces [2].

Histologically, psoriasis is characterized by regular psoriasiform epidermal hyperplasia, diminished or absent granular layer, parakeratosis, and neutrophilic micro abscesses [3].

Psoriasiform dermatoses represent a spectrum of inflammatory skin diseases that resemble psoriasis both clinically and histologically. These include conditions like lichen simplex chronicus, pityriasis rubra pilaris, and seborrheic dermatitis [4]. Although these conditions may present similar epidermal changes, subtle differences in histopathological patterns help in differentiation.

Given the potential clinical overlap, micromorphological features remain central to accurate diagnosis and management planning [5]. This study aims to delineate these differences using standard H&E stained sections.

MATERIALS AND METHODS

Study design: Cross-sectional comparative study done between August 2023 and March 2025.

Sample size: 60 biopsies (30 psoriasis, 30 psoriasiform dermatoses).

Procedure: Punch biopsies were processed routinely and stained with H&E. Microscopic features including hyperkeratosis, parakeratosis, acanthosis, rete ridge elongation, and neutrophilic infiltration were graded (0–3 scale). Statistical analysis was performed using Fisher's exact and chi-square tests, with $p < 0.05$ considered significant.

Inclusion Criteria

- Adequately preserved skin biopsies with confirmed histological diagnosis of either psoriasis or psoriasiform dermatoses.
- Biopsies from any anatomical site.

Exclusion Criteria

- Coexisting infections or malignancies in the biopsy.
- Inadequate or poorly stained specimens.

METHODOLOGY

Haematoxylin and eosin-stained sections were evaluated under light microscopy. Histopathological features were graded semi-quantitatively:

- **Hyperkeratosis** (0 to 3)
- **Parakeratosis** (0 to 3)
- **Acanthosis** (0 to 3)
- **Rete Ridge Elongation** (1 to 3)
- **Neutrophilic Infiltrate** (0 to 3).

Statistical Analysis

Comparisons between psoriasis and psoriasiform groups were made using the Fisher's exact test. A p-value of <0.05 was considered statistically significant.

The results of the study are comparing histopathological findings between psoriasis and psoriasiform dermatoses. 30 cases of psoriasis and 30 cases of psoriasiform dermatoses. Histopathological findings analysis including hyperkeratosis, parakeratosis, acanthosis, rete ridges and neutrophilic infiltration.

Age	**Psoriasis (n=30)**		**Psoriasiform Dermatoses (n=30)**		**Independent T test**	**P value**
Mean SD	39.33±18.33		40.13±20.84		**0.158**	**0.875**
Range	13-77		8-79			
Gender	**Frequency**	**%**	**Frequency**	**%**	**χ^2**	**P value**
Female	10	33.3	9	30	**0.77**	**0.500**
Male	20	66.7	21	70		

In the current study majority of psoriasis case falls between 13-77 years and psoriasiform dermatoses falls between 8-79 years with P value = 0.875. which shows no significant difference. In psoriasis case there were 10 females and 20 males and psoriasiform dermatoses 9 females and 21 females with P value = 0.500 which is also not significant. This indicate age and gender did not influence the diagnosis (Table 1).

Hyperkeratosis in psoriasis, with all 30 cases (100%) exhibiting **grade 0** hyperkeratosis. In contrast, psoriasiform dermatoses showed a more varied presentation: 1 case (3.3%) had no hyperkeratosis, 7 cases (23.3%) showed **grade 1 (minimal)**, 13 cases (43.3%) had **grade 2 (mild)**, and 9 cases (30%) had **grade 3 (moderate)** hyperkeratosis. The difference in distribution was statistically highly significant ($\chi^2 = 64.353$, **$p < 0.001$**), indicating that higher grades of hyperkeratosis are significantly associated with psoriasiform dermatoses.

Severe parakeratosis was observed in many cases of psoriasis: 13 cases (43.3%) showed **grade 1 (minimal)**, 4 cases (13.3%) **grade 2 (mild)**, and 12 cases (40%) **grade 3 (moderate)** parakeratosis. Only 1 case (3.3%) lacked parakeratosis. In contrast, 15 cases (50%) of psoriasiform dermatoses showed **no parakeratosis**, with the remaining distributed as follows: 13 cases (43.3%) **grade 1**, 1 case (3.3%) **grade 2**, and 1 case (3.3%) **grade 3**. The difference between the two groups was statistically significant ($\chi^2 = 23.36$, **$p < 0.001$**), highlighting parakeratosis as a key differentiating feature in psoriasis.

30 cases of psoriasis showed varying degrees of acanthosis, with 17 cases (56.7%) showing **grade 2 (mild)** and 12 cases (40%) **grade 3 (moderate)**. Only 1 case (3.3%) had **grade 1 (minimal)** acanthosis. In psoriasiform dermatoses, 4 cases (13.3%) showed **no acanthosis**, 19 cases (63.3%) exhibited **grade 1**, 5 cases (16.7%) **grade 2**, and only 2 cases (6.7%) **grade 3** acanthosis. The difference in acanthosis grades between the two groups was highly significant ($\chi^2 = 33.88$, **$p < 0.001$**), with psoriasis demonstrating greater epidermal thickening.

A marked difference was noted in the pattern and degree of rete ridge elongation. In psoriasis, 16 cases (53.3%) exhibited **grade 3 (moderate)** elongation and 13 cases (43.3%) **grade 2 (mild)**. Only 1 case (3.3%) had **grade 1 (minimal)** rete ridges. In contrast, among psoriasiform dermatoses, **3 cases** showed grade 3 elongation; the majority (25 cases, 83.3%) had **grade 2**, followed 2

cases (6.7%) with **grade 1** rete ridges. The difference was statistically significant (χ^2 = 13.08, **p = 0.001**), suggesting that pronounced rete ridge elongation is more characteristic of psoriasis. (Table 2).

The presence and degree of **neutrophilic infiltration** in the epidermis were assessed and graded from 0 to 3 across both psoriasis and psoriasiform dermatoses cases. In **psoriasis**, the majority of cases (19 out of 30; **63.3%**) showed **grade 1** neutrophilic infiltration, and higher grades were also observed—**grade 2** in 3 cases (10%) and **grade 3** in 5 cases (16.7%). Only 3 cases (10%) lacked neutrophils (grade 0). In contrast, **psoriasiform dermatoses** showed markedly reduced neutrophilic infiltration: the majority (17 out of 30; **56.7%**) had **no neutrophilic infiltration (grade 0)**, and 13 cases (43.3%) exhibited only **grade 1** infiltration. Importantly, **no cases** in this group showed **grade 2 or 3** neutrophil presence. A highly statistically significant difference was observed between the two groups (**p < 0.001**), indicating that neutrophilic infiltration is a key distinguishing feature in psoriasis.

Table 1: Comparison of age and sex between psoriasis and psoriasiform dermatoses.

	Psoriasis		**Psoriasiform Dermatoses**		**Total n(%)**	**χ^2**	**P value**
	Frequency	**%**	**Frequency**	**%**			
Hyperkeratosis							
0 No	30	100	1	3.3	31(51.7)		
1 Minimal	0	0	7	23.3	7(11.7)		
2 Mild	0	0	13	43.3	13(21.7)	**64.353**	**<0.001**
3 Moderate	0	0	9	30	9(15)		
Total	**30**	**50**	**30**	**50**	**60(100)**		
Parakeratosis							
0 No	1	3.3	15	50	16(26.7)		
1 Minimal	13	43.3	13	43.3	26(43.3)		
2 Mild	4	13.3	1	3.3	5(8.3)	**23.36**	**<0.001**
3 Moderate	12	40	1	3.3	13(21.7)		
Total	**30**	**50**	**30**	**50**	60(100)		
Acanthosis							
0 No	0	0	4	13.3	4(6.7)		
1 Minimal	1	3.3	19	63.3	20(33.3)		
2 Mild	17	56.7	5	16.7	22(36.7)	**33.88**	**<0.001**
3 Moderate	12	40	2	6.7	14(23.3)		
Total	**30**	**50**	**30**	**50**	60(100)		
Rete Ridges							
0 No	0	0	0	0	0		
1 Minimal	1	3.3	2	6.7	3(5)		
2 Mild	13	43.3	25	83.3	38(63.3)	**13.08**	**0.001**
3 Moderate	16	53.3	3	10	19(31.7)		
Total	**30**	**50**	**30**	**50**	60(100)		

Table 2: Histopathological changes in both psoriasis and psoriasiform dermatoses.

Neutrophil Grading	**Psoriasis**		**Psoriasiform Dermatoses**		**Total n(%)**
	Frequency	**%**	**Frequency**	**%**	
0	3	10	17	56.7	20(33.3)
1	19	63.3	13	43.3	32(53.3)
2	3	10	0	0	3(5)
3	5	16.7	0	0	5(8.3)
Total	**30**	**100**	**30**	**100**	**60(100)**
Fischer's Exact Test=18.78, P Value <0.001					

Table 3: Comparing the Neutrophil Grading Between Psoriasis and Psoriasiform Dermatoses.

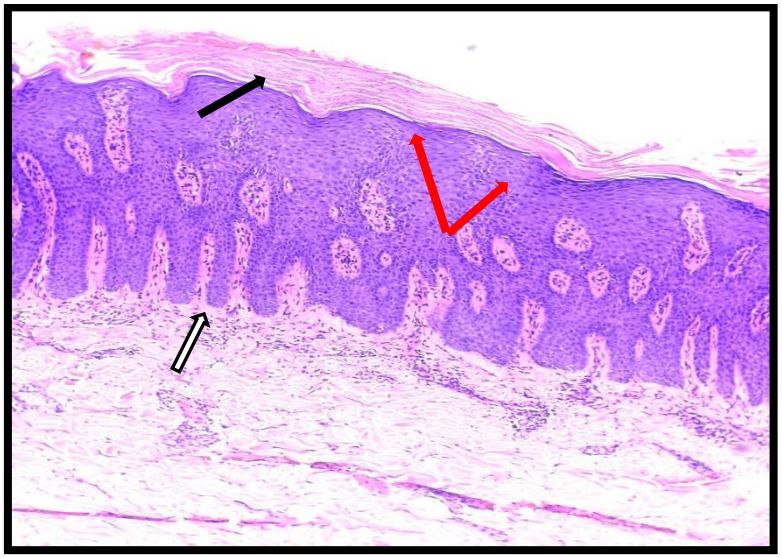

Figure 1: Psoriasis with parakeratosis (Black arrow), regular acanthosis, elongated rete ridges (White arrow) and hyper and hypogranulosis (red arrow) (H& E x 100).

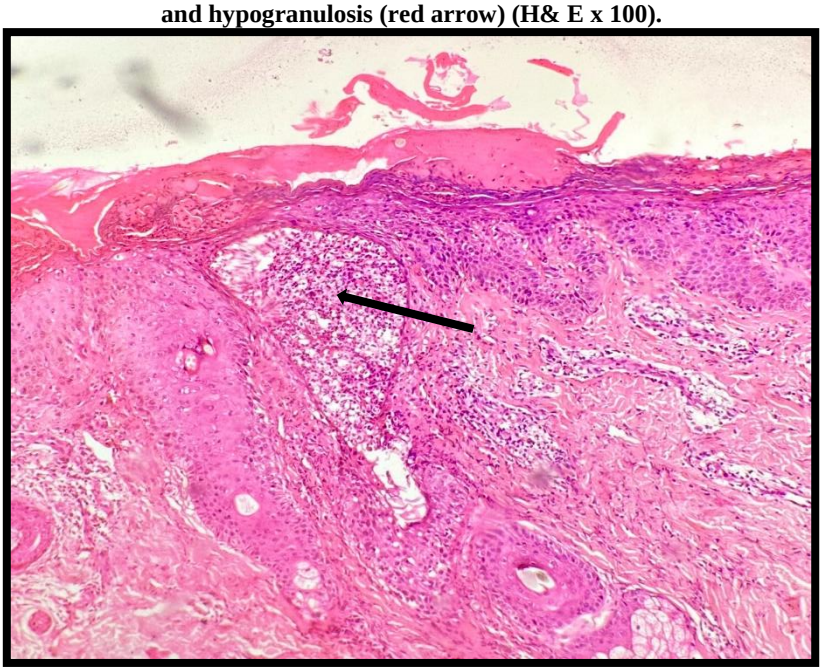

Figure 2: Psoriasis with spongiform pustules of kogoj (Black arrow), (H& E x 100).

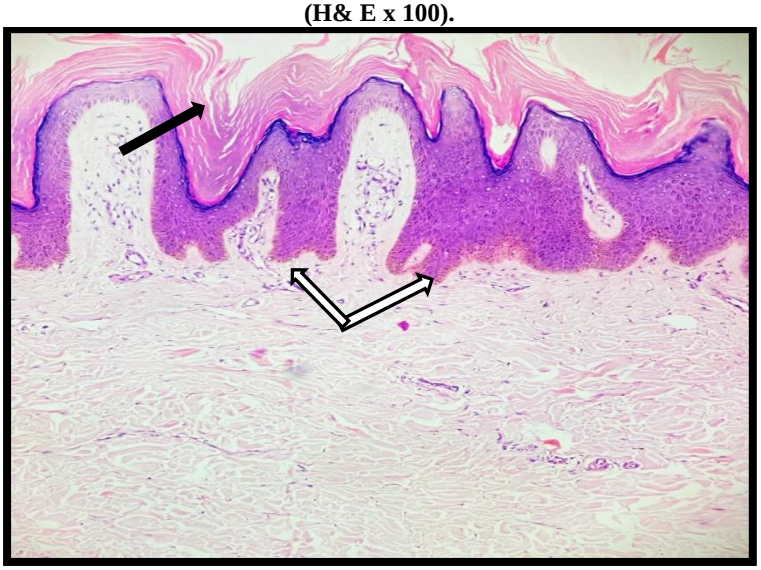

Figure 3: Psoriasiform dermatitis showing hyperkeratosis (Black arrow), irregular acanthosis (White arrow) and rete ridges. (H& E x 100)

DISCUSSION

The present study highlights the diagnostic utility of routine histological features in distinguishing psoriasis from psoriasiform dermatoses.

Parakeratosis and acanthosis were more prominent and consistent in psoriasis. Munro microabscesses, although not seen in all cases, are virtually pathognomonic when present. These findings are consistent with descriptions in standard dermatopathology references and corroborated by earlier studies on the diagnostic hallmarks of psoriasis by Griffiths CEM et al and Resnik KS et al. [6,7].

In contrast, psoriasiform dermatoses showed more prominent hyperkeratosis and irregular acanthosis. The absence of suprapapillary thinning, and minimal neutrophilic exocytosis in these lesions, further aids in exclusion of psoriasis by Ackerman AB et al [8]. Features such as follicular plugging, compact orthokeratosis, and deeper perivascular lymphocytic infiltrate—more typical of psoriasiform dermatoses—were not commonly seen in psoriasis cases, supporting the value of these distinctions by Calonje E et al [9].

Our findings align with Murphy and Mihm's classification, which emphasizes that the pattern of epidermal changes, particularly the configuration of rete ridges and the thickness of the suprapapillary plate, provides consistent discriminatory features in chronic inflammatory dermatoses by Murphy GF et al [10].

Importantly, **neutrophilic infiltration** in the epidermis emerged as a significant differentiating factor between the two conditions. In the psoriasis group, 26.7% of cases demonstrated **grade 2 or 3 neutrophilic infiltration**, while none of the psoriasiform dermatoses cases exhibited such higher grades. This difference was statistically significant (**Fisher's exact test = 18.78, $p < 0.001$**). The migration of neutrophils into the stratum corneum results in the formation of Munro's microabscesses and spongiform pustules of Kogoj, considered highly specific histopathologic markers of psoriasis by Bianchi L et al and Lowes MA et al [11,12]. This neutrophilic response is linked to activation of the **IL-23/IL-17 axis**, which promotes recruitment and activation of neutrophils via cytokines such as IL-8 and TNF-α. Psoriasiform dermatoses, on the other hand, are not associated with such pronounced cytokine-mediated neutrophilic infiltration and thus lack these features histologically by Di Cesare A et al [13].

Furthermore, in our study, the presence of neutrophilic infiltration correlated with other key histological features of psoriasis, such as confluent parakeratosis, regular psoriasiform hyperplasia, and thinning of the suprapapillary plate. This reinforces the idea that multiple overlapping microscopic findings—when seen together—are more specific and diagnostic than any single feature alone by James WD and Lowes MA et al [3,12].

Overall, this study underscores the importance of carefully assessing **neutrophilic activity** alongside architectural epidermal changes in routine H&E stained sections. While histopathology alone may not always provide absolute diagnostic certainty, the pattern recognition of these features significantly enhances the reliability of diagnosis and helps avoid misclassification of mimickers such as chronic eczema, lichen simplex chronicus, or seborrheic dermatitis.

CONCLUSION

Accurate differentiation between psoriasis and psoriasiform dermatoses is achievable through evaluation of H&E stained sections. Regular acanthosis, confluent parakeratosis, and neutrophilic micro abscesses are hallmark features of psoriasis. Hyperkeratosis and irregular acanthosis favour psoriasiform dermatoses. Recognition of these subtle but distinct features remains integral to dermatopathological diagnostics.

REFERENCES

1. Parisi R, Symmons DP, Griffiths CE, Ashcroft DM. Global epidemiology of psoriasis: a systematic review of incidence and prevalence. *J Invest Dermatol*. 2013;133(2):377–385.
2. Lebwohl M, Gniadecki R, de Jager MEA, et al. Psoriasis. *Lancet*. 2014;386(9997):983–994.
3. James WD, Elston DM, Treat JR. *Andrews' Diseases of the Skin: Clinical Dermatology*. 13th ed. Elsevier; 2019.
4. Elder DE, Elenitsas R, Johnson B, Murphy GF. *Lever's Histopathology of the Skin*. 11th ed. Lippincott Williams & Wilkins; 2015.
5. Weedon D. *Skin Pathology*. 4th ed. Churchill Livingstone; 2015.
6. Griffiths CEM, Barker JNWN. Pathogenesis and clinical features of psoriasis. *Lancet*. 2007;370(9583):263–271.
7. Resnik KS. Diagnostic criteria in psoriasiform dermatitis. *Am J Dermatopathol*. 1994;16(1):37–42.
8. Ackerman AB, Boer A. *Histologic Diagnosis of Inflammatory Skin Diseases: An Algorithmic Method Based on Pattern Analysis*. 3rd ed. Ardor Scribendi; 2005.
9. Calonje E, Brenn T, Lazar AJ, McKee PH. *McKee's Pathology of the Skin*. 5th ed. Elsevier; 2019.
10. Murphy GF, Mihm MC. Inflammatory diseases of the epidermis. In: Elder DE et al., editors. *Lever's Histopathology of the Skin*. 11th ed. Wolters Kluwer; 2015.
11. Bianchi L, Diluvio L, Campione E, Chimenti S. T cells and neutrophils in the pathogenesis of psoriasis. *Dermatol Ther*. 2010;23(2):123–131.
12. Lowes MA, Suarez-Farinas M, Krueger JG. Immunology of psoriasis. *Annu Rev Immunol*. 2014;32:227–255.
13. Di Cesare A, Di Meglio P, Nestle FO. The IL-23/Th17 axis in the immunopathogenesis of psoriasis. *J Invest Dermatol*. 2009;129(6):1339–1350.