ORIGINAL ARTICLE

# Clinico-histomorphological study of psoriasis and *Psoriasiform dermatitis*

*Shagun Gupta[1], Meenakshi Tyagi[1*], Anupam Varshney[1], Tarang Goyal[1], Alok Mohan[1], Shweta Grover[1]*

*[1]Department of Pathology, Muzaffarnagar Medical College, Muzaffarnagar-251001 (Uttar Pradesh) India*

## Abstract

*Background*: Psoriasis is a chronic inflammatory papulosquamous disorder. *Psoriasiform dermatitis* on the other hand is a frequently encountered terminology in a variety of inflammatory dermatoses. It poses diagnostic challenge and may require a histopathological confirmation for the diagnosis. *Aim and Objectives:* To evaluate and correlate clinical and histomorphological features in psoriasis and *Psoriasiform dermatitis*. *Material and Methods:* This was an observational study involving 100 patients, with a clinical diagnosis of psoriasis or *Psoriasiform dermatitis* as one of the differential diagnoses and its correlation with histopathological features along with CD34 immunostaining differences. *Results:* In our study, there was significant clinical and histopathological concordance in psoriasis and *Psoriasiform dermatitis*. Fifty cases each of *Psoriasiform dermatitis* and psoriasis were enrolled of which middle age group was affected more with slight male preponderance. The histological variation between psoriasis and *Psoriasiform dermatitis*was determined and CD34 immunohistochemical marker was applied to further aid the diagnosis. *Conclusion:* The present study emphasizes clinical and histopathological concordance of cases of psoriasis and *Psoriasiform dermatitis* due to significant difference in patient management and need for further work up.

**Keywords:** Papulosquamous, Psoriasiform hyperplasia, Munro's microabscess

## Introduction

Psoriasis is a chronic inflammatory papulo-squamous disorder which is mediated by the immune system and is characterised by episodes of remissions and exacerbations. The incidence of psoriasis is 2-3% people worldwide and the etiology of this disease is still unclear. The condition is a frequent relapsing chronic inflammatory disease that leads to a noteworthy morbidity [1]. The condition is characterised by a complex association of immunological, genetic, and environmental factors [1-2]. Clinically diagnosis of psoriasis is featured by a well-defined margin and presence of glossy white scale upon the shiny homogenous membrane. The most common types are plaque and pustular psoriasis [3-4]. The consecutive psoriatic scales removal generally shows underlying smooth, shiny red membrane having various bleeding points from which thin suprapapillary epithelium is removed (Auspitz sign) [3]. *Psoriasis vulgaris* is observed to have a tropism for extensors because of trauma related lesions or Koebner (isomorphic) phenomenon [4].

Histologically, the differentiation between *Psoriasiform dermatitis* and *Psoriasis vulgaris* is necessary [5-6]. The psoriasiform term refers to the lesion which either resemble psoriasis clinically or histologically [7]. Different psoriasiform lesions with similar histological and clinical features like psoriasis are atopic dermatitis, pityriasis rosea, lichen simplex chronicus, seborrheic dermatitis, pityriasis rubra pilaris and allergic contact dermatitis [6]. This group of diseases are

histologically featured by the occurrence of parakeratosis, associated with an inconsistent quantity of hyperkeratosis, epidermal hyperplasia with elongated rete pegs and presence of perivascular superficial inflammatory infiltrate [8].

Regular epidermal hyperplasia, dilated blood vessels found in dermal papillae and Kogoj's or Munro micro abscess have been found to be the most invariable histopathological characters in the skin biopsy of psoriasis [9]. Features like irregular epidermal hyperplasia, spongiosis and absence of Kogoj's and Munro's micro abscess have been constantly seen in *Psoriasiform dermatitis* [10]. It has been observed that the histopathological changes vary with the clinical features and stage of the disease, as found in patients on managing the condition [11]. The common histological characteristics are featured by the inflammatory dermatoses, however there are precise microscopic features that are pathognomonic for each main type of this disease [12]. The clinical and pathological associations are highly significant, to diagnose the lesion histologically before subjecting patients to the systemic therapy as it can hamper the particular microscopic characteristics of the particular condition [13].

The present study was conducted to assess the profile, histopathological determinants and their association with clinical findings of psoriasis and *Psoriasiform dermatitis* and to evaluate clinical presentation and correlate histomorphological features in psoriasis and *Psoriasiform dermatitis*.

**Material and Methods**

This was an observational study conducted in the Department of Pathology, Medical College and Hospital, Western U.P. Biopsy specimens clinically diagnosed as psoriasis and *Psoriasiform dermatitis* received were taken. Total sample size was 100 cases. Inadequate biopsy and unwilling patients were excluded. This study was approved by Institutional Ethics Committee and written informed consent was taken from the patients. SPSS17/20 and StatCalc 2.0 were used for statistical analysis. Value of $p < 0.05$ was considered significant for statistical analysis. The CD34 immunohistochemical staining intensity was evaluated by performing capillary counting in the 3 most highly vascularized areas selected under 40× field. Single or clusters of endothelial cells, with or without lumen were considered to be individual vessels. They were scored depending upon the number of vessels stained. If the number of vessels stained were between 4 and 10, then it was categorized as weak, if it was between 11-20 and it as moderate and if it was between 21 and 28, it was categorized as strong. Control group included normal skin biopsies.

**Results**

In the present study, total 100 cases were recruited. Out of them, 50 cases were clinically diagnosed as psoriasis (Group A) and 50 cases as *Psoriasiform dermatitis* (Group B). Skin biopsy of all the patients were taken and based on their histopathological findings, they were grouped into histopathologically diagnosed psoriasis (Group C) and histopathologically diagnosed *Psoriasiform dermatitis* (Group D). Group A and B were clinically diagnosed groups while groups C and D were histologically diagnosed groups. In the present study, out of 50 cases of clinically diagnosed psoriasis, 36 cases were histopathologically diagnosed as psoriasis i.e. 72 cases (Group E) and 14 cases were histopathologically diagnosed as *Psoriasiform dermatitis*. Among 50

cases of clinically diagnosed *Psoriasiform dermatitis*, 43 cases were histopathologically diagnosed as *Psoriasiform dermatitis* i.e. 86 cases (Group F), 7 cases were histopathologically diagnosed as psoriasis. Groups E and F revealed clinical-histopathological concordance percentage. Therefore, out of 100 cases, 43 cases were histopathologically diagnosed as psoriasis (Group C), 57 cases were histopathologically diagnosed as *Psoriasiform dermatitis* (Group D) (Table 1).

**Epidemiology and histological spectrum**

In our study both psoriasis and *Psoriasiform dermatitis* presented in wide range of age group with the most common age group being 41-60 years. The mean age of psoriasis being 43 ± 16.12 years and mean age of *Psoriasiform dermatitis* being 37 ± 17.53 years. No predominant sex predilection was observed in our study, however there was slight male predominance with male to female ratio being 1.1:1 in psoriasis and 1.5:1 in *Psoriasiform dermatitis*. In the present study, histological spectrum of psoriasis out of 43 cases of histologically diagnosed psoriasis included 35 (81.39%) cases of psoriasis vulgaris, 4 cases of guttate psoriasis and 4 cases of pustular psoriasis. Therefore, most common type was *Psoriasis vulgaris*. In histological spectrum of *Psoriasiform dermatitis*, out of 57 cases of histologically diagnosed *Psoriasiform dermatitis,* the most common was pityriasis rosea which constituted 12 cases, 8 cases were of lichen simplex chronicus, 6 cases of spongiotic dermatitis, 4 cases each of pityriasis rubra pilaris, seborrheic dermatitis and Bowen's disease, 3 cases each of allergic dermatitis and Inflammatory Linear Verrucous Epidermal Nevus (ILVEN), 2 cases each of parapsoriasis and scabies and 1 case each of mycosis fungoids and erythroderma. Seven cases could not be given any subtypes (Figures 1 & 2).

**Histological determinant**

Groups C and D i.e. histopathologically diagnosed psoriasis and *Psoriasiform dermatitis* were further studied. Significant difference was observed in the distribution of the cases according to acanthosis. Proportion of the cases with regular acanthosis

**Table 1: Clinical and histological groups**

| Groups | N (%) |
|---|---|
| **A. Clinically psoriasis** | 50 (50) |
| **B. Clinically *Psoriasiform dermatitis*** | 50 (50) |
| **C. Histologically psoriasis** | 43 (43) |
| **D. Histologically *Psoriasiform dermatitis*** | 57 (57) |
| **E. Clinical and histologically concordant psoriasis** | 36 (72) |
| **F. Clinical and histologically concordant *Psoriasiform dermatitis*** | 43 (86) |
| **Overall concordant (Concordancerate)** | 79 (79) |

were more in psoriasis as compared to *Psoriasiform dermatitis* while it's vice versa was observed with irregular acanthosis.

**Distribution of the cases according to epidermal determinants**

Epidermal changes like parakeratosis (100%) followed by thinning of suprapapillary plate (93.02%) and diminished/absent granular layer (90.69%), Munro's microabscess (62.79%) were significantly more in psoriasis as compared to *Psoriasiform dermatitis*. However *Psoriasiform dermatitis* showed parakeratosis (84.21%) followed by mild spongiosis (66.66%) and exocytosis of lymphocyte (24.56%) (Table 2).

**Table 2: Distribution of the cases according to epidermal changes (histopathological determinant in different types)**

| Epidermal Changes | Psoriasis N(%) | *Psoriasiform dermatitis* N(%) | Chi-square | *p* | Significance |
|---|---|---|---|---|---|
| **Acanthosis (Regular)** | 38 (88.37) | 7 (12.28) | 57.33 | 0.00001 | < 0.001 |
| **Acanthosis (Irregular)** | 5 (11.63) | 50 (87.72) | | | |
| **Parakeratosis** | 43 (100) | 48 (84.21) | | | |
| **Thinning of supra-papillary plate** | 40 (93.02) | 1 (1.75) | 84.40 | 0.00001 | < 0.001 |
| **Diminished/absent granular layer** | 39 (90.69) | 13 (22.80) | 45.26 | 0.00001 | < 0.001 |
| **Munro's microabscess** | 27 (62.79) | 0 | | | |
| **Hyperkeratosis** | 24 (55.81) | 29 (50.88) | 0.24 | 0.6243 | > 0.05 |
| **Kogoj's Pustule** | 6 (13.95) | 0 | | | |
| **Alternate ortho and parakeratosis** | 0 | 7 (12.28) | | | |
| **Hypergranulosis** | 0 | 24 (42.12) | | | |
| **Thick supra-papillary plate** | 0 | 21 (36.84) | | | |
| **Spongiosis** | 15 (34.88) | 38 (66.66) | 9.94 | 0.0016 | < 0.05 |
| **Follicular plugging** | 0 | 4 (7.02) | | | |
| **Exocytosis of lymphocytes** | 1 (2.33) | 14 (24.56) | 9.50 | 0.002 | < 0.05 |
| **Spongiform pustule** | 4 (9.30) | 0 | | | |
| **Pautrier microabscess** | 0 | 1 (1.75) | | | |

**Distribution of the cases according to dermal determinants**

Vascular changes (72.09%) and papillary edema (25.58%) were significantly more in psoriasis as compared to *Psoriasiform dermatitis* while perivascular lymphocytic infiltration (61.40%) was significant in *Psoriasiform dermatitis*. No significant difference was observed in dermal inflammation among both psoriasis and *Psoriasiform dermatitis*. (Table 3).

**Comparison of psoriasis and *Psoriasiform dermatitis* using CD34 marker**

CD34 marker was applied to all the skin biopsies along with 10 cases of normal skin biopsies which were taken as control. It was observed that 95% of psoriatic biopsies showed strong to moderate positivity while in contrast 25% of *Psoriasiform dermatitis* cases showed only moderate positivity and majority of the cases were of mild positivity (Table 4).

**Table 3: Distribution of the cases according to dermal determinants (histopathological determinant in different types)**

| Dermal Changes | Psoriasis N(%) | *Psoriasiform dermatitis* N(%) | Chi-square | *p* | Significance |
|---|---|---|---|---|---|
| **Papillary edema** | 11 (25.58) | 6 (10.53) | 3.93 | 0.047 | < 0.05 |
| **Dermal inflammation** | 34 (79.07) | 38 (66.66) | 1.87 | 0.17 | > 0.05 |
| **Vascular changes** | 31 (72.09) | 4 (7.02) | 45.62 | 0.00001 | < 0.001 |
| **Perivascular lymphocytic** | 7 (16.28) | 35 (61.40) | 20.48 | 0.00001 | < 0.001 |
| **Vertically arranged collagen bundles in papillary dermis** | 2 (4.65) | 7 (12.28) | 1.742 | 0.1868 | > 0.05 |

**Table 4: Comparison of psoriasis and *Psoriasiform dermatitis* using CD34 marker**

| Dermal Changes | Psoriasis N(%) | *Psoriasiform dermatitis* N(%) | Control |
|---|---|---|---|
| **Mild** | 2 (4.65) | 43 (75.43) | 10 (100) |
| **Moderate** | 12 (27.91) | 14 (24.57) | 0 |
| **Strong** | 29 (67.44) | 0 | 0 |
| **Total** | 43 (100) | 57 (100) | 10 (100) |

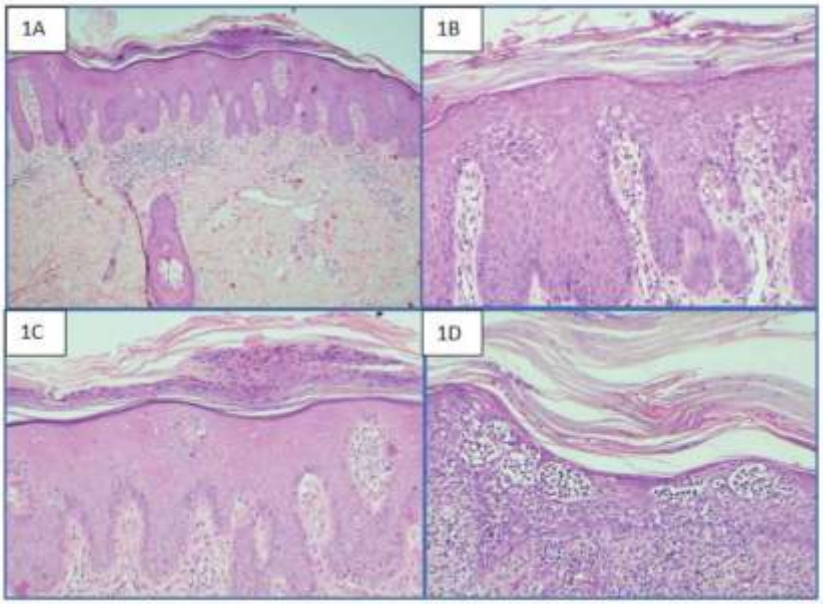


**Figure 1: Psoriasis (H&E stain) (A) hyperkeratosis, parakeratosis, regular acanthosis, thinning of suprapapillary plate, sawtooth reteridges (B) spongiosis,vascular changes (C) Munro's microabscess (D) Kogoj's microabscess**

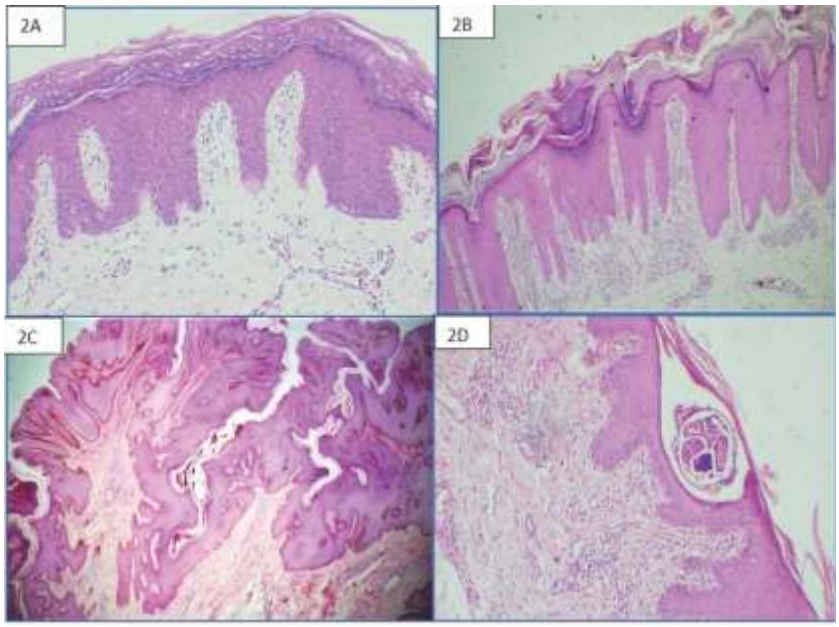


**Figure 2: *Psoriasiform dermatitis* (A) Pityriasis rubra pilaris (B) Lichen simplex chronicus (C) Inflammatory Linear Verrucous Epidermal Nevus (ILVEN) (D) Scabies**

**Discussion**

Psoriasis is a genetically determined, inflammatory and proliferative disease of the skin which is characterized by dull red, sharply demarcated scaly plaques. Psoriasis consists of many different clinical variants and usually resemble other skin diseases. Besides, the same patient can also present at different times with a different clinical presentation or variant [11].

In the present study, both psoriasis and *Psoriasiform dermatitis* presented in the age group of 41-60 years with no predominant sex predilection which was consistent with the findings of the study conducted by Jayalakshmi *et al*. [14] while it was in contrast with the study by Venna *et al*. [5] in which the most common age group affected was 31-40 years in both psoriasis and *Psoriasiform dermatitis*.

In the present study, most common epidermal changes noticed noticed in psoriasis were parakeratosis (100%) followed by thinning of suprapapillary plate (93.02%), diminished/ absent granular layer (90.69%), regular acanthosis (88.37%), hyperkeratosis (55.81%), Munro's microabscess (62.79%) and mild spongiosis (34.88%).

In the study conducted by Jayalakshmi *et al*. [14], findings were similar to our study with 100% cases showing regular acanthosis, parakeratosis and thinning of suprapapillary plate, with majority of the cases (97.5%) showing diminished/absent granular layer and 87.5% cases showing Munro's microabscess. However, hyperkeratosis was only showed by 25% of cases. Thus findings in our study were almost similar with the findings of the study conducted by Jayalakshmi *et al*. [14].

While in study conducted by Mehta *et al*. (2009) [7] most significant findings were regular acanthosis (88.52%), diminished/absent granular layer (83.6%) followed by parakeratosis, thinning of suprapapillary plate and Munro's microabscess, each being in 62.29% of cases. Mild spongiosis was seen in only 29.50% of their cases which is almost similar to our study (34.88%). In another study conducted by Gyanchandani *et al*. (2020) [4], most significant findings were diminished/ absent granular layer and Munro's microabscess, each being 100%; regular acanthosis was in 80% and thinning of suprapapillary plate was in 55% while it was 93.02% in the present study.

Among the dermal change in psoriasis, the present study showed dermal inflammation (79.07%) which was also seen significantly in the study conducted by Jayalakshmi *et al*. [14] (100%) followed by vascular changes which was present in 72.09% of cases in our study which is in accordance with previous studies conducted by Mehta *et al*. [7], Jayalakshmi *et al*. [14] and Ahmed *et al*. [15]. However, in contrast, papillary edema was seen in only 25.58% of cases in our study while it was present in more than half of the cases in the study by Ahmed *et al*. [15]. Also vertically arranged collagen bundles was seen in 4.65% of cases in our study but it was absent in the study by Gyanchandani *et al*. (2020) [4]. Overall after comparing these studies it shows that most consistent histological epidermal changes in psoriasis include regular acanthosis, parakeratosis, thinning of suprapapillary plate, diminished/absent granular layer and Munro's microabscess while among dermal changes most common was dermal inflammation and vascular change.

In *Psoriasiform dermatitis*, most common epidermal changes seen in our study was parakeratosis (84.21%) followed by mild spongiosis (66.66%),

hyperkeratosis (50.88%) and exocytosis of lymphocytes was only in 24.56% of samples, whereas in previous study conducted by Mehta *et al*. (2009) [7] most common finding was mild spongiosis (64.10%) followed by exocytosis of lymphocytes (56.41%) which was noticed in significant number of cases in our study as well. Their study also showed diminished/absent granular layer in 48.71% of cases whereas it was seen in only 22.80% of cases in our study.

While among the dermal changes in *Psoriasiform dermatitis,* most common finding in our study was dermal inflammation followed by perivascular lymphocytic infiltration and vertically arranged collagen bundles in papillary dermis where as in the previous study conducted by Mehta *et al*. (2009) [7] vertically arranged collagen bundles in papillary dermis (46.15%) was appreciated which was seen in only 12.28% of cases in our study. Thus, in *Psoriasiform dermatitis* cases the significant histological epidermal changes were irregular acanthosis, parakeratosis, mild spongiosis and hyperkeratosis.

Also hypergranulosis, thick suprapapillary plate and exocytosis of lymphocytes were noticed in fair number of cases. While among dermal determinants, dermal inflammation and perivascular lymphocytic infiltrate were more common. In the morphometric analysis it was observed that psoriasis cases showed strong to moderate positivity of CD34 while it was weak to moderate in *Psoriasiform dermatitis* cases which was in accordance with the study by Gupta *et al*. [16] and Amin *et al*. [17] .Thus the use of CD34 IHC proved to be a good determinant in differentiating the cases.

## Conclusion

Results of our study concluded that though there is high clinical and histological concordance in both Psoriasis and *Psoriasiform dermatitis*, still histopathological diagnosis is considered gold standard along with immunohistochemistry for a conclusive diagnosis and better patient care.

## References


1. Abdelsalam HFF, Gobran MA, Abdelwahab MM, Abdelaziz HD. A comparative study of psoriasis and psoriasiform dermatoses on basis of Ki67 immunohistochemical expression. *Egyp J Hosp Med* 2022; 86:840-844.
2. Elgharib I, Khalifa N, Elasser O, ElGhareeb M, Hosny D. Serum endocan levels in patients with psoriasis vulgaris as a marker of disease severity. *Zagazig Univ Med J* 2020; 26(3): 517-523.
3. Steinhoff M, Ammoury AF, Ahmed HM, Gamal MFS, El Sayed MH. The unmet need for clinical guidelines on the management of patients with plaque psoriasis in Africa and the Middle East. *Psoriasis (Auckl)* 2020;10: 23-28.
4. Gyanchandani N, Kalaivani P, Shivashekar G, Ramraj B. Clinicomorphological correlation of psoriasis and psoriasiform dermatitis. *Int J Clin Diagn Pathol* 2020; 3(2):1-5.
5. Venna AB, Chittla S, Malkud S. A clinicopathological study of psoriasis and psoriasiform dermatitis. *J Evid Based Med Healthc* 2020; 7(51), 3085-3089.
6. Altman E, Kamino H. Diagnosis: psoriasis or not? What are the clues? *Semin Cutan Med Surg* 1999; 18(1):25- 35.
7. Mehta S, Singal A, Singh N, Bhattacharya SN. A study of clinicohistopathological correlation in patients of psoriasis and psoriasiform dermatitis. *Indian J Dermatol Venereol Leprol* 2009;75(1):100.

8. Chanadanwale SS, Panicker NK, Kulkarni SP, Shah KR, Kumar H, Sharma YK, *et al*. Morphometry analysis of psoriasis and psoriasiform dermatitis: A retrospective study of 50 cases. *Med J DY Patil Univ* 2015;8(1):43-47.
9. Pinkus H, Mehregan AH. Psoriasiform tissue reaction. In: Pinkus H, Mehregan AH, editors. A guide to dermatohistopathology. 3rded. New York: Appleton-Century-Crofts; 1981: 97-108.
10. Ackerman B, Chongchitnant N, Sanchez J. Inflammatory disease. In: Ackerman B, Chongchitnant N, Sanchez J, Guo Y, Bennin B, Reichel M, *et al.* editors. Histologic diagnosis of inflammatory skin conditions: An algorithmic method based on pattern analysis. 2nded. Philadelphia: Williams and Wilkins; 1997: 663-673.
11. Christofers E, Mroweitz U. Psoriaisis. In: Freedberg IM, Eisen AZ, Wolff K, Goldsmith LA, Austen KF, Fitzpatrick TB, *et al*. editors. Fitzpatrickís Dermatology in General Medicine. 5th ed. New York: McGraw Hill; 1999: 495-521.
12. Balan R, Grigoraş A, Popovici D, Amălinei C. The histopathological landscape of the major psoriasiform dermatoses. *Arch Clin Cases* 2021;6(3):59-68.
13. Rohl R, Bax D, Schierer S, Bogner PN, Hernandez-Ilizaliturri F, Paragh G. A case for histologic verification of the diagnosis of atypical psoriasis before systemic therapy. *JAAD Case Rep* 2018;4(5):465-467.
14. Jayalakshmy PL, Babitha AM, Sankar S, Nandakumar G. Histopathological spectrum of Psoriasiform dermatitis. *J Pathol Nepal* 2016; 6(12): 975-980.
15. Ahmed Abdullah Alhumidi. Retrospective 10 years review of 100 patients with psoriasis in the Kingdom of Saudi Arabia (KSA). *Am J Res Comm* 2013; 1(8): 114-120.
16. Sehgal VN, Dogra S, Srivastava G, Aggarwal AK. Psoriasiform dermatoses. *Indian J Dermatol Venereol Leprol* 2008; 74(2):94-99.
17. Amin MM, Azim ZA. Immunohistochemical study of osteopontin, Ki-67, and CD34 of psoriasis in Mansoura, Egypt. *Indian J Pathol Microbiol* 2012; 55(1): 56-60.



***Author for Correspondence:***

*Dr. Meenakshi Tyag, Department of Pathology, Muzaffarnagar Medical College, Muzaffarnagar-251001, Uttar Pradesh*

*Email: shagungupta.gs@gmail.com Cell: 8791188179*



**How to cite this article:**

Gupta S, Tyagi M, Varshney A, Goyal T, Mohan A, Grover S. Clinico-histomorphological study of psoriasis and *Psoriasiform dermatitis*. *J Krishna Inst Med Sci Univ* 2023; 12(3):41-49

***Submitted:*** *24-Mar-2023* ***Accepted:*** *24-May-2023* ***Published:*** *01-July-2023*