

# Psoriasis - A Clinicopathological Correlation in a Tertiary Care Hospital

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## ABSTRACT

**Background** - Psoriasis is a group of common chronic inflammatory and proliferative skin conditions associated with systemic manifestations in many organ systems. Its prevalence is poorly defined in India and its presentation varies with different stages and can simulate various other conditions also.

**Materials and Methods** - This retrospective study was conducted to study the clinical and histomorphological variants of psoriasis and incidence of age and sex distribution in various types of psoriasis in a tertiary care hospital. 9 parameters were used to assess and categorize the various types of psoriasis –

- 1) Hyperkeratosis
- 2) Parakeratosis
- 3) Munro's microabscesses
- 4) Pustule of Kogoj
- 5) Supra – papillary thinning
- 6) Elongated rete ridges
- 7) Inflammatory infiltrate in the dermis
- 8) Capillary proliferation and dilatation
- 9) Spongiosis

**Results** – A male preponderance with maximum cases in the 31 – 40 years age group was found in our study. The predominant histological type was that of Psoriasis vulgaris (63%) followed by Chronic Plaque Psoriasis (18%). Amongst the cutaneous features of psoriasis, Scales were the most common (92%) followed by plaques (83%). The most commonly involved site was that of the upper extremities (79%). Amongst the epidermal histopathological features of psoriasis, acanthosis was seen in 100% cases followed by hyperkeratosis in 95% cases. The dermal features showed dermal infiltration in 97% cases.

**Conclusion** – Psoriasis has multiple relapses and remissions and also varied clinical presentations. Its diagnosis at the earliest is important to halt its progression and histomorphology helps in that. This study concluded that even though most changes occur in the epidermis in cases of psoriasis, there are a few dermal changes too which can aid the pathologist in arriving at the diagnosis. This study also helped in finding the prevalence of this disease in India, as there is paucity of the same in our country. Thus overall, this study helped in finding the various histomorphological features which are diagnostic of psoriasis as well as their incidence in various subtypes of psoriasis. It also adds to the data of the disease in our country and will help in better clinical management as well as triage of patients.

**Key words** – Dermatology, Histopathology, Plaques, Psoriasis, Scales, Vulgaris.

## INTRODUCTION

Psoriasis is defined as a group of common, chronic inflammatory and

proliferative conditions of skin, associated with systemic manifestations in many organ systems. The most characteristic lesions

consist of red, scaly, sharply demarcated, indurated plaques, present particularly over the extensor surfaces of limbs and scalp. [1]

Prevalence of psoriasis is 0.1% to 3% of the world population. It is seen in the 2<sup>nd</sup> and 3<sup>rd</sup> decades of a person's life. [2] There is paucity of data related to exact burden of psoriasis in India. [3] However, in few hospital – based studies, the incidence of psoriasis is reported as 0.44% - 2% of patients. [4,5]

Clinically the presence of well defined silvery white scales is characteristic of psoriasis. These scales reveal underlying smooth red membrane with bleeding points on removal of suprapapillary epithelium, which is called Auspitz sign. [6]

The cardinal histomorphological features of psoriasis are a combination of the following:- acanthosis, mounds of parakeratosis in an orthokeratotic cornified layer, suprapapillary thinning, papillomatosis, inter-cellular edema, scattered mitosis of basal and prickle cells and diminished or absent granular layer, tortuous capillaries in papillary dermis and perivascular infiltration of lymphocytes. The most important diagnostic features of psoriasis are presence of micro Munro abscesses and neutrophilic aggregates in the uppermost portion of the spinous layer to form spongiform pustules of Kogoj. [6,7]

Psoriasis has different clinical subtypes which may simulate various other dermatological disorders, [8] e.g. – neutrophils in the keratotic layers and spongiosis can be seen in infectious conditions, namely dermatophytosis and candida infections. Irregular hyperplasia, lymphocytic exocytosis and spongiosis along with vertical orientation of dermal collagen are seen in psoriasiform dermatitis. [6] This presents a diagnostic challenge for the clinician and hence histopathological confirmation becomes mandatory. [8]

As clinical presentation of psoriasis varies at different stages of the disease and may simulate various other diseases, hence this study was conducted to categorize various stages, types, histopathological

features of psoriasis and their manifestations according to different age groups to obtain credible data of the patients.

#### **AIMS/OBJECTIVES OF STUDY**

- 1) To study the clinical and histomorphological variants of psoriasis.
- 2) To study the incidence of age and sex distribution in various types of psoriasis.

#### **MATERIALS AND METHODS**

A retrospective study was undertaken in the department of pathology in a tertiary care hospital in Navi Mumbai on 100 cases of clinically diagnosed psoriasis patients, for a period of 5 years from January 2015 to December 2019. A biopsy was taken from the lesion, in the department of dermatology of the same hospital. All biopsies were fixed in formalin and then processed in histopathology section of the Central Laboratory. The sections were stained with routine hematoxylin and eosin stain and various histopathological features were studied.

#### **Inclusion Criteria –**

- 1) Clinically diagnosed cases of psoriasis
- 2) Patients of all age groups and both genders were included in this study.

#### **Exclusion Criteria –**

- 1) Patients unwilling for biopsy or not giving informed valid consent.
- 2) Pregnant women
- 3) Inadequate biopsy samples (biopsies showing only dermis or epidermis on histologic examination)
- 4) Skin biopsies done for cases other than psoriasis.

No scoring system was used for this study.

**Histopathology –** The biopsies were evaluated for the presence or absence of the following nine criteria:-

- 1. Hyperkeratosis** - thickening of the stratum corneum.

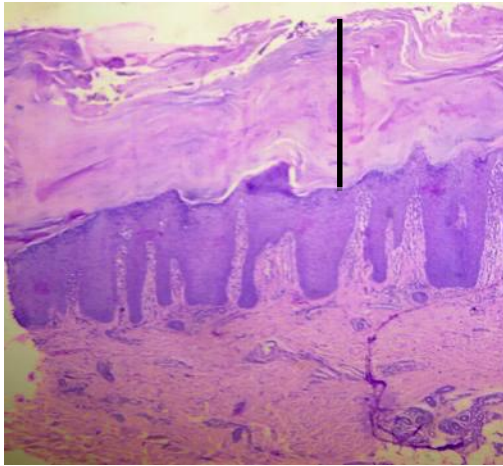


Fig 1 – Thickened Stratum Corneum

2. Parakeratosis - presence of abrupt keratinization resulting in retained nuclei in the stratum corneum.

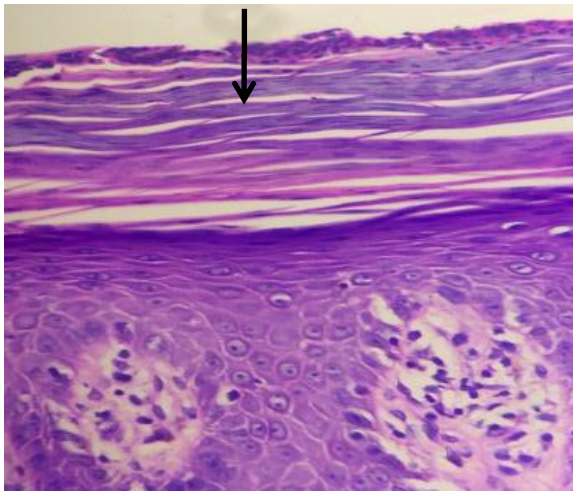


Fig 2 – Parakeratosis

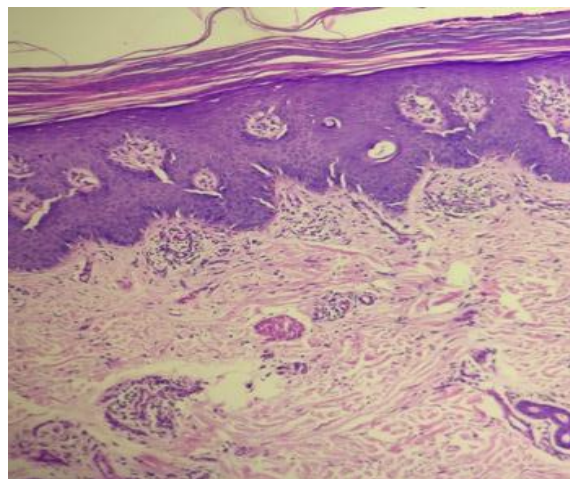


Fig 2 – Parakeratosis

3. Munro's microabscess –presence of collections of neutrophils in the corneal layer.

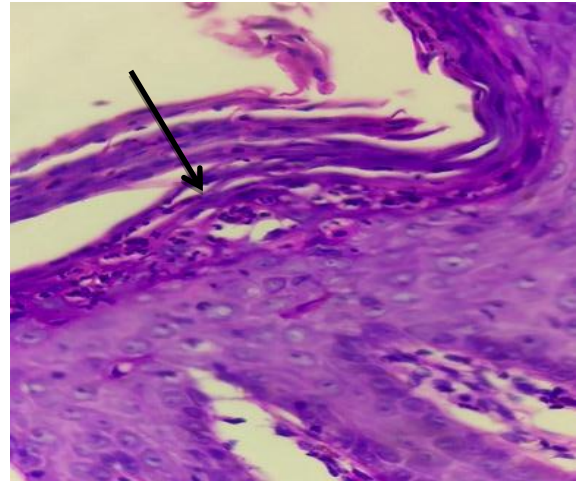


Fig 3 – Munro's microabscess

4. Pustule of Kogoj – presence of collections of neutrophils in the stratum spinosum.

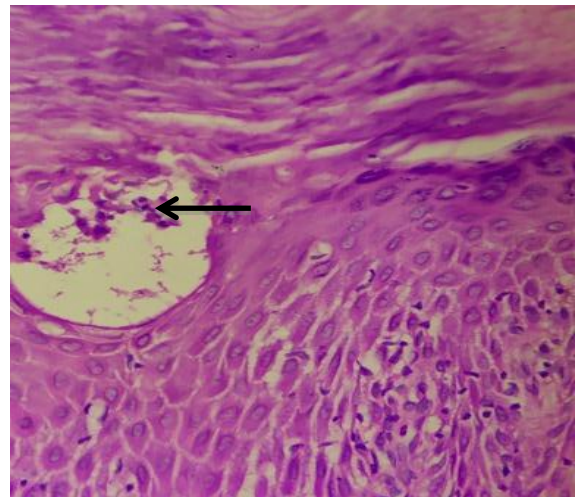


Fig 4 – Pustule of Kogoj

5. Supra-papillary thinning – thinning of the granular layer at the tips of the papillae.

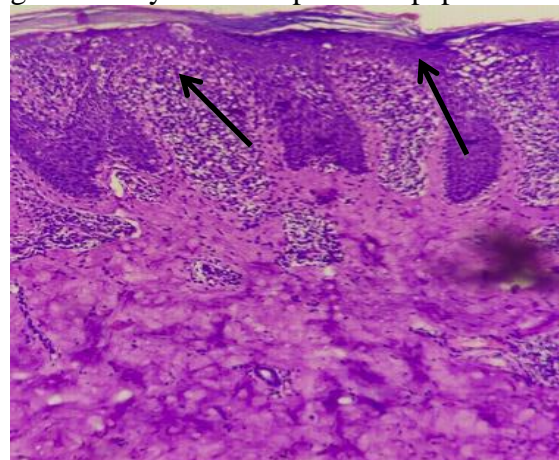


Fig 5 – Supra-papillary thinning



6. Elongated rete ridges – widened and club shaped rete ridges.

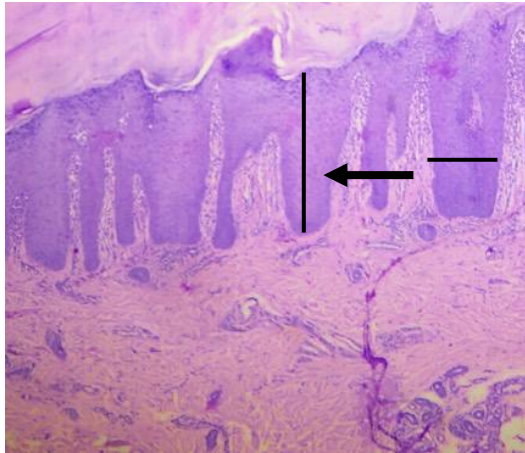


Fig 6 – Elongated club shaped rete ridges (Arrow)

7. Inflammatory infiltrate present in the dermis.

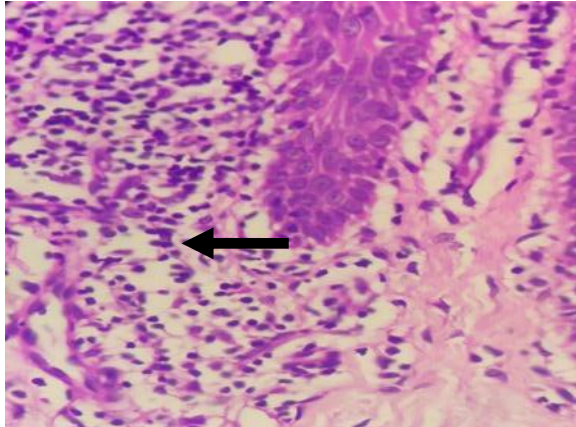


Fig 7 – Dermal inflammatory infiltrate

8. Capillary proliferation and dilatation at the tips of the papillae.

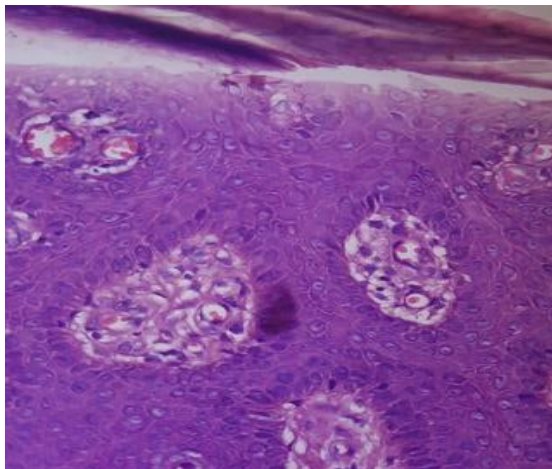


Fig 8 – Dilated capillaries

9. Spongiosis is defined as accumulation of extracellular fluid within the epidermis with resultant separation of the keratinocytes.

## OBSERVATIONS AND RESULTS

Following results were obtained in this study.

Table 1 Sex-wise distribution of diagnosed cases of Psoriasis.

Period of 2015 - 19	No. of cases diagnosed as Psoriasis / Total number of skin biopsies	Incidence of psoriasis (%)
Total no. of cases	100/1152	8.6
Total Males	71/100	71
Total Females	29/100	29
Male : Female ratio	2.4 : 1	

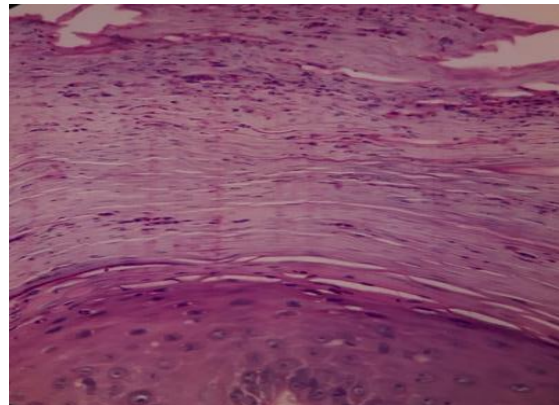
Table 2 – Age-wise distribution of cases of Psoriasis (n = 100)

Age groups - years	Number of cases	% of occurrence
0-10	4	4
11-20	5	5
21-30	23	23
31-40	27	27
41-50	8	8
51-60	21	21
61-70	7	7
71-80	4	4
81-90	1	1
91-100	0	--

The youngest patient was aged 7 years and the oldest was 82 years old. No patient was diagnosed with psoriasis over the age of 90 years. The mean age was 35.44 years.

Table 3 –Histological types of Psoriasis (n = 100)

Histological types of psoriasis	No. of Cases detected	Frequency (%)
Psoriasis Vulgaris	63	63
Palmo-Plantar Psoriasis	7	7
Guttate Psoriasis	2	2
Chronic Plaque Psoriasis	18	18
Pustular Psoriasis	5	5
Follicular Psoriasis	3	3
Erythrodermic Psoriasis	1	1
Inverse Psoriasis	1	1
Total	100	100



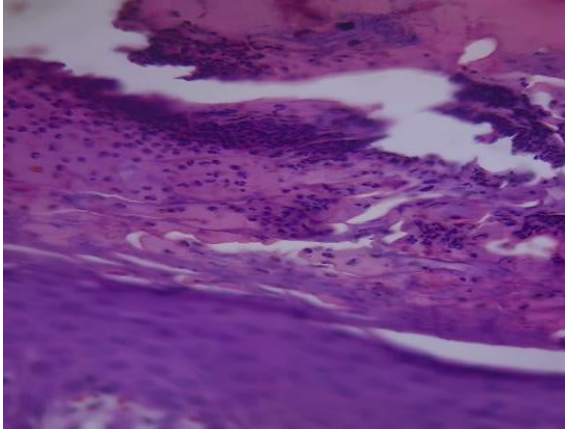


Fig 9 – Pustular psoriasis

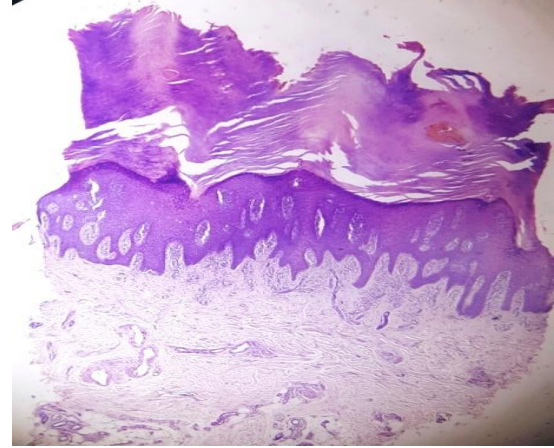


Fig 12 – Palmo – Plantar Psoriasis

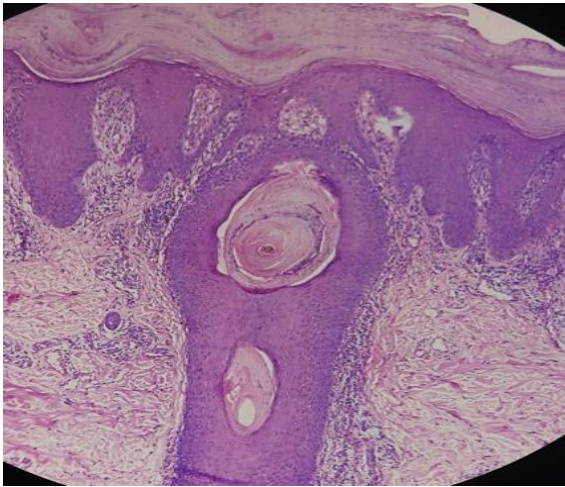


Fig 10 – Follicular Psoriasis

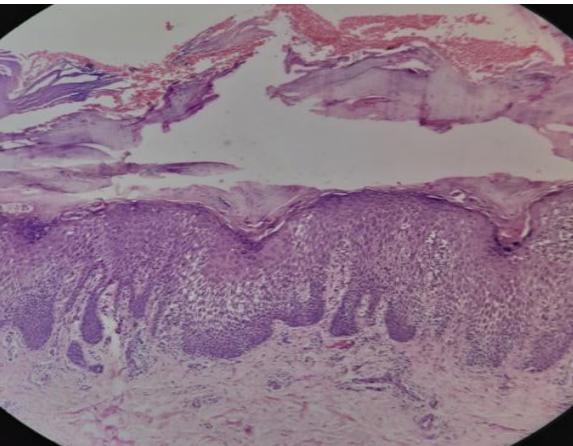


Fig 11 – Erythrodermic Psoriasis

Table 4 – Cutaneous features of Psoriasis (n = 100)

Cutaneous features of Psoriasis	No of cases	Frequency (%)
Papules	25	25
Plaques	83	79
Scales	92	92
Pustules	5	5
Erythema	54	54
Hypopigmented Halo	29	29
Exfoliation	16	16
Auspitz Sign	36	36
Koebner response	22	22

Amongst the cutaneous features, scaling was the commonest (92%) and pustules least common (5%). Auspitz sign was seen in 36% cases and Koebner's phenomenon in 22% cases. (Table 4).

Table 5 – Sites of Involvement

Site	Number of cases having site involvement	Percentage (%)
Scalp	46	46
Trunk	64	64
Upper extremities	79	79
Lower Extremities	75	75
Nails	30	30
Palms and Soles	68	68
Face and Neck	10	10
Back	40	40
Joints	20	20

Out of 100 patients diagnosed as psoriasis, 23% patients had a family history of psoriasis and 51% cases complained of exacerbation of symptoms during winters, suggestive of a seasonal variation.

Table 6 – Histopathological features of Psoriasis

Histopathological feature	Number of cases (n = 100)	Percentage of cases having positive finding
<b>Epidermal Features</b>		
Hyperkeratosis	95	95
Parakeratosis	85	85
Acanthosis	100	100
Munro-micro Abscess	40	40
Kogoj abscess	18	18
Elongation of rete ridges	90	90
Spongiosis	39	39
Suprapapillary thinning	27	27
<b>Dermal Features</b>		
Vascular proliferation	93	93
Dilated and Tortuous capillaries	93	93
Dermal infiltration	97	97



Of histopathological features in the epidermis, acanthosis (100%) was the most widely occurring feature followed by hyperkeratosis (95%) and the least observed

was pustule of Kogoj (18%). Amongst the dermal features, dermal infiltration by chronic inflammatory cells (97 %) was the commonest. (Table 6)

Table 7 – Histopathology of various clinical types of Psoriasis

Histopathological feature	Clinical Type							
	P vulgaris	Palmo-plantar	Guttate	Chronic Plaque	Pustular	Follicular	Inverse	Erythrodermic
Hyperkeratosis	63	7	1	18	5	1	--	--
Parakeratosis	60	4	1	18	1	--	1	--
Acanthosis	63	7	2	18	5	3	1	1
Spongiosis	27	2	--	5	4	--	--	1
Micro Munro abscess	21	3	--	11	5	--	--	--
Kogoj abscess	9	1	--	3	5	--	--	--
Elongation of rete ridges	63	7	1	15	3	1	--	--
Suprapapillary thinning	16	4	1	4	2	--	--	--
Capillary dilation	60	7	0	17	5	2	1	1
Dermal infiltration	63	7	1	17	5	3	1	--

Table 8 – Age wise distribution of various subtypes of psoriasis

Age Groups	P vulgaris	Guttate	Palmo - plantar	Chronic plaque	Follicular	Pustular	Erythrodermic	Inverse
0 – 10	2	--	1	1	--	--	--	--
11 – 20	2	1	--	1	1	--	--	--
21 – 30	16	--	1	4	1	1	--	--
31 – 40	13	--	2	8	--	2	1	1
41 – 50	5	--	--	1	1	1	--	--
51 – 60	19	--	--	1	--	1	--	--
61 – 70	3	1	2	1	--	--	--	--
71 – 80	2	--	1	1	--	--	--	--
81 – 90	1	--	--	--	--	--	--	--
91 - 100	--	--	--	--	--	--	--	--

## DISCUSSION

Psoriasis is a chronic inflammatory proliferative condition where genetic and environmental factors play a great role in development of manifestations. This is why there is wide discrepancy in the incidence of this disease among different ethnic and racial groups and in different parts of the world. [12] Studies estimate a worldwide incidence of psoriasis from 0.3% - 2%. [13] Since studies conducted in India are even fewer in number and based on the number of patients attending dermatological clinics, an accurate assessment of its occurrence in general population cannot be made.

In our study, psoriasis accounted for 8.6% of the total patients attending dermatology outpatient departmental clinics, which was similar to finding in the study of S. Kumar et al, which showed a prevalence of 8%. [14] However, this finding at variance in comparison with other studies where the prevalence was lower, for example – 1.2% in a study conducted by Raghuvver et al [12] and 4% in Kalpana Kumari M.K’s [10] study.

Our study showed male to female ratio as 2.4 : 1 which was similar to that in other studies, such as 2.5:1 in Bedi et al [15] and 2.7:1 in Arora et al. [3]

Upper extremities (79%) were the most commonly involved site followed by lower extremities (75%), palms and soles (68%) and trunk (64%) in order of involvement. The least commonly involved site was face and neck (10%). This finding showed great disparity in comparison with other studies where the most often involved site was lower extremities. For example, Alhumidi AA reported involvement of lower extremities (42%) followed by upper extremities (27%), back (22%) and scalp (8%) respectively [16]. Bai S et al reported lower limb (90%) involvement as maximum followed by upper limb (75%) and back (43.3%). [11]

A study conducted by Baker H reported that high humidity was beneficial and there was worsening of the skin lesions during winter in psoriasis. [17] Bedi TR noted seasonal variation in 46% patients, half of

whom got worsening of symptoms in winters. [15] Similarly, Kaur I et al [5] and Zlotogorski A [18] studies reported improvement of skin lesions in summer as compared to winter which was similar to

our study. Another explanation could be that the xerosis associated with low humidity in winter partly explains the seasonal variation. [19]

**Table 9 – Comparison of findings with other studies.**

Histopathological Feature	Present Study (n = 100) %	Bai et al <sup>(11)</sup> (n = 60) %	Raghuveer et al <sup>(12)</sup> (n = 100) %	Kumari K <sup>(10)</sup> (n = 50) %	Arora et al <sup>(3)</sup> (n = 101) %	Pandit et al <sup>(20)</sup> (n = 42) %	Gordon and Jonson <sup>(21)</sup> (n = 100) %
Hyperkeratosis	95	100	89	82	44.5	23.8	28
Parakeratosis	85	100	77	100	100	100	97
Acanthosis	100	---	75	98	96.1	97.61	100
Supra-papillary thinning	27	36.67	---	86	41.5	95.23	98
Munro microabscess	40	55	58	44	29.7	83.33	75
Pustules of Kogoj	18	46.67	30	20	8.9	11.9	31
Spongiosis	39	91.67	---	70	10.8	95.23	84
Dilated Capillaries	93	88.33	90	100	98.1	97.61	96
Dermal Chronic Inflammatory Infiltrate	97	33.34	98	100	---	100	95

Acanthosis was the commonest feature amongst all (100%) in our study. Similar finding was observed by Gordon and Jonson too, as shown in table 9 above. Kumari K, Arora et al and Pandit et al observed parakeratosis as a more common feature than acanthosis in their respective studies. This was followed by acanthosis and hyperkeratosis. These findings were different from the order of occurrence in our study which showed an occurrence of acanthosis as 100%, followed by hyperkeratosis and parakeratosis respectively.

Supra-papillary thinning was seen in 27% cases in our study, a finding which matched that of Bai et al (36.67%) and Arora et al (41.5%). The other studies showed a very high occurrence of supra-papillary thinning probably because this is a very subjective finding.

The occurrence of Munro microabscesses was noted as 40% in the present study which matched closely with that of Kumari K (44%). The other studies showed a higher incidence of Munro microabscesses with only Arora et al showing an occurrence of 29.7%.

Presence of chronic inflammatory infiltrate in the dermis was noted in 97% of cases in our study. A finding which matched that of Raghuveer et al (98%), Gordon and

Jonson (95%), Kumari K (100%) and Pandit et al (100%).

## CONCLUSION

Psoriasis is a disease that has multiple relapses and remissions and its clinical presentations can be varied in each cycle in the same patient also. Psoriasis could also be confused with other dermatological diseases having similar presentations (e.g. – lichen planus, psoriasiform dermatitis), thus further complicating the diagnosis.

It is therefore important to identify it at the earliest to halt its progression and in such cases, histopathological examination of skin biopsy plays an important role in quickly arriving at the correct diagnosis. The presentation of psoriasis could be varied even in skin biopsies, but a few features like acanthosis, parakeratosis, etc are almost always present and aid in its diagnosis.

This study also concluded that even though most changes of this lesion are noted in the epidermis, there are a few dermal changes, which if carefully looked for, can aid the pathologist in arriving at the diagnosis. Thus, it's HPE that eventually helps in aiding diagnosis and makes it imperative to perform a skin biopsy in suspected cases.

This study also aimed to elucidate the Indian scenario and its outcomes as that is a relatively lesser studied area. We concluded that there needs to be a more definite and targeted approach towards diagnosing psoriasis with HPE being made mandatory along with other latest diagnostic techniques to detect this disease early.

### Limitations of This Study

Since this study was a retrospective one, the effect of treatment on the clinical symptoms as well as changes seen in the skin biopsy could not be studied. Also no intervention could be done due to the retrospective nature of the study. The newer diagnostic modalities and immunohistochemistry were also not employed in this study.

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### REFERENCES

1. Griffiths C, Barker J, Bleiker T, Chalmers R & Creamer D, editors. Rooks Textbook of Dermatology. 9<sup>th</sup> ed. Publisher: Wiley-Blackwell, 2016
2. Regan W. Nevoid psoriasis? Unilateral psoriasis. *Int j dermatol* 2006;45:1001-1002.
3. Arora D, Mittal A, Ahmad F, Dutta S, Awasthi S. The spectrum of histomorphological features in psoriasis : a three years study. *Trop J Path Micro* 2019;5(2):58-62.
4. Dogra S, Yadav S. Psoriasis in India: prevalence and pattern. *Indian J Dermatol Venereol Leprol.* 2010 Nov – Dec;76(6): 595-601.
5. Kaur I, Handa S, Kumar B. Natural history of psoriasis: a study from the Indian subcontinent, *J Dermatol.* 1997 Apr; 24(4):230-4.
6. Weedon D, Strutton G, Rubin AI, *Skin pathology* 3<sup>rd</sup> edition UK: Churchill living stone, Elsevier. 2010.72-83.
7. Christofers E, Mroweitz U. Psoriasis, In: Freedberg IM, Eisen AZ, Wolff K, Golsmith LA, Austen KF, Fitzpatrick TB, et al. editors. *Fitzpatrick's Dermatology in General Medicine*, 7<sup>th</sup> edition. New York: McGraw Hill. 1999;169-93.
8. Mehta S, Singal A, Singh N, et al. A study of clinicohistopathological correlation in patients of psoriasis and psoriasisiform dermatitis. *Indian J Dermatol Venereol Leprol.* 2009 Jan-Feb;75(1):100.
9. Moorchung N, Khullar J S, Mani N S, Chatterjee M, Vasudevan B, Tripathi T. A study of various histopathological features and their relevance in pathogenesis of psoriasis. *Indian J Dermatol* 2013;58:294-8.
10. Kumari K. Psoriasis and significance of clinicopathological correlation in a tertiary care hospital. *Archives of Cyto & Histopath Research* 2017;2(2):23-26.
11. Bai S, Sowmya S. Histopathologic diagnostic parameters of psoriasis; a clinicopathological study. *Int J Res Med Sci* 2016;4:1915-20.
12. Raghuvver C, Shivanand DR, Rajashekar N. Clinico-histopathological Study of Psoriasis. *Int J Sci Stud* 2015;3(7):176-179.
13. Nevitt GJ, Hutchinson PE. Psoriasis in the community: Prevalence, severity and patients' beliefs and attitudes towards the disease. *Br J Dermatol* 1996;135:533-7.
14. Kumar S, Nayak CS, Padhi T, Rao G, Rao A, Sharma VK, Srinivas CR. Epidemiological pattern of psoriasis, vitiligo and atopic dermatitis in India: Hospital – based point prevalence. *Indian Dermatol Online J.*2014;5:S6-8.
15. Bedi TR. Clinical profile of psoriasis in North India. *Indian J DermatolVenereolLeprol* 1995;61:202-5.
16. Alhumidi AA. Retrospective 10 years review of 100 patients with psoriasis in the Kingdom of Saudi Arabia. *American Journal of Research Communication* 2013;1(8):114-20.
17. Baker H. Psoriasis: a review. *Dermatologica.* 1975;150:16-25.
18. Zlotogorski A. Psoriasis of the left elbow. *Australas J Dermatol.* 1989;30:106.
19. Anderson TF, Voorhees JJ. Psoriasis In:Thiers BH, Dobson RL, editors.



- Pathogenesis of Skin Disease. New York: Churchill Livingstone; 1986:6-84.
20. Pandit GA, Narayankar SL. Significance of clinicopathological correlation in psoriasis. Med J DY Patil Univ 2015; 8:481-5
21. Gordon M, Johnson WC. Histopathology and histochemistry of psoriasis. I. The active lesion and clinically normal skin. Arch Dermatol 1967;95:402-7.
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