Histopathological Features and Clinical Variants of Biopsy Confirmed Psoriasis Cases in a Tertiary Care Setting in Kerala

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ABSTRACT

BACKGROUND
Psoriasis is a chronic, immune mediated, relapsing, papulosquamous disease having a high prevalence. Since it affects other organ systems such as musculoskeletal system, gastrointestinal system and the eye, it can lead to considerable disability. Although only rarely life threatening, it has high morbidity due to its chronicity and absence of cure.

METHODS
This study was conducted over a period of 2 years in the Department of Pathology, Medical College, Thiruvananthapuram. A total of 217 skin biopsy specimens in which a clinical diagnosis / differential diagnosis of psoriasis was made, was studied during this period.

RESULTS
108 cases out of 217 which were histopathologically diagnosed as psoriasis were studied in detail. Male predominance was noted in the study population. The mean duration of disease in this study was 6.69 yrs. Fifty percentage of the patients had associated comorbidities with hypertension outnumbering others. Among male patients, 26 (32.5 %) had the habit of smoking. The most common presentation was as erythematous scaly plaques, with pruritus being the second most common presentation. Histopathology proved to be conclusive of psoriasis in all cases. Hyperkeratosis was seen in all cases which was the most consistent histopathological feature. Confluent parakeratosis which is one of the characteristic features of psoriasis was seen in 62 (57.4 %) cases with the rest being focal. Other epidermal features studied were papillomatosis, hypogranulosis, suprapapillary thinning, and basal mitotic figures. Spongiosis was seen in 83 (76.9 %), exocytosis of neutrophils in 66 (61.1 %) and Munro's micro abscess in 42 (38 %) cases. Dilated blood vessel was the most common dermal change observed, seen in 105 (97 %). Lymphocytes were the most frequent upper dermal inflammatory infiltrate observed. Oedema was seen in 5 (4.6 %) of cases.

CONCLUSIONS
Psoriasiform lesions pose diagnostic dilemma to the treating clinician. To provide a clear-cut diagnosis, histopathological evaluation is essential. It is also important to differentiate between the different variants of psoriasis in the context of treatment. It has an important role in the follow up of psoriatic patients.

KEY WORDS
Psoriasis, Papulosquamous, Erythematous Scaly Plaques, Confluent Parakeratosis, Regular Acanthosis, Hyperkeratosis

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DOI: 10.14260/jemds/2020/514

How to Cite This Article:


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**BACKGROUND**

Psoriasis is a chronic immune mediated lifelong disease that primarily affects the skin. Since it affects other organ systems such as musculoskeletal system, gastrointestinal system and the eye, it can lead to considerable disability. Although only rarely life threatening, it has high morbidity due to its chronicity and absence of cure. It affects the quality of life as patients are embarrassed by their appearance, have reduced levels of employment and income. Psoriasis is a relapsing papulosquamous dermatitis characterized by hyper proliferation of epidermis. It is a multifactorial disease with a genetic background. It comprises of well circumscribed red scaly papules and plaques. The disease has a major impact on the health care systems and on society in general because of its high prevalence. Due to these implications, the clinician and pathologist need to work in close collaboration to offer a diagnosis of psoriasis and to differentiate between other papulosquamous lesions. Psoriasis has many different clinical variants which mimic various dermatological conditions like secondary syphilis, seborrhiec dermatitis, pityriasis rosea and parapsoriasis. The recurring nature and prognosis of psoriasis differs from other psoriasiform dermatitis. Clinical features alone are not reliable and can cause diagnostic dilemma. So, it is essential to have a histopathological confirmation of the clinical diagnosis for the satisfactory management of the conditions. Further, histological material provides evidence and can be preserved for future review. So as in other dermatological conditions, histopathology is considered as gold standard for diagnosis.

**Objectives**

1. To assess the clinical and histopathological features of psoriasis
2. To study the clinico pathological correlation in patients with psoriasis
3. To identify the histopathological features useful in subtyping psoriasis.

**METHODS**

This is a case series study conducted at the Department of Dermatology OPD / IPD and Department of Pathology, Government Medical College, Thiruvananthapuram from 2011 January to 2012 December.

**Inclusion Criteria**

Skin biopsy specimens from all consecutive new cases received in the department with a clinical diagnosis/ differential diagnosis of psoriasis was included.

**Exclusion Criteria**

Those patients, who did not give consent.

**Method of Data Collection**

General information regarding the patient such as age, sex, age at onset, clinical presentation, duration, history of smoking and prior treatment, family history, comorbidities associated, and various histopathological parameters were studied. The skin biopsy specimens fixed in 10 % formalin received in the Department of Pathology were taken. These tissues were processed and 5 micrometer thickness sections were taken from paraffin embedded tissues. The sections were stained with haematoylin and eosin. Detailed study of histopathologically diagnosed cases of psoriasis was done. Histopathological features helpful in identifying different types of psoriasis were assessed. Results were correlated and compared with the clinical diagnosis.

**Sample Size and Sampling**

All cases fulfilling the inclusion criteria who attended Dermatology Department were included in the case series. Among the 217 cases, 108 which were histopathologically diagnosed as psoriasis were studied in detail. No sampling techniques were employed.

**Statistical Analysis**

Data entry and analysis were done using statistical software “Epi Info”. Categorical variables were expressed as proportions and quantitative variables as mean and standard deviation.

**RESULTS**

During the study period, out of the 217 cases in which there were a clinical/differential diagnosis of psoriasis, 108 (49.8 %) cases were histopathologically diagnosed as psoriasis. The age ranged from 5 yrs. in the youngest to 80 yrs. in the oldest. Mean age of the patients was 44 years. The most common age group of patients in this study was between 31.25 and 55.75 years. The mean age among males was 44.2 yrs. and for that of females was 43.7 yrs. 25.9 % belong to the age category of 51-60. Majority of the patients were males (74.1 %) with a male: female ratio of 2.9:1 the mean duration of disease at histopathologic confirmation was 6.69 years. Most of the people (40.8 %) had a duration of disease between 2-9 years. Out of the 108 patients 47 (43.5 %) patients had undergone prior treatment before biopsy.

<table>
<thead>
<tr>
<th>Type of Lesion</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythematous scaly plaques</td>
<td>79</td>
<td>73</td>
</tr>
<tr>
<td>Scalp scaling</td>
<td>43</td>
<td>39.8</td>
</tr>
<tr>
<td>Nail changes</td>
<td>53</td>
<td>49</td>
</tr>
<tr>
<td>Gen. Exfoliation</td>
<td>18</td>
<td>16.6</td>
</tr>
<tr>
<td>Pustules</td>
<td>16</td>
<td>14.8</td>
</tr>
<tr>
<td>Pruritus</td>
<td>63</td>
<td>58.3</td>
</tr>
<tr>
<td>Palm &amp; sole involvement</td>
<td>23</td>
<td>21.3</td>
</tr>
<tr>
<td>Arthritis</td>
<td>5</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Table 1. Clinical Features

The commonest clinical features observed were Erythematous scaly plaques, pruritus and nail changes. Overall 26 (24.17) patients were smokers. But when the females were excluded (none gave history of smoking) the percentage rose to 32.5 percentage among males. Hypertension (22.9 %), diabetes.
mellitus (14.8%), both HTN and DM (7.4%) and Coronary artery disease (6.48%) were the commonly associated comorbidities.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Number (%)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prominent dermal blood vessel</td>
<td>105</td>
<td>97.3</td>
</tr>
<tr>
<td>Lymphocytes as the upper dermal infiltrates</td>
<td>70</td>
<td>64.8</td>
</tr>
<tr>
<td>Normal Connective tissue &amp; Appendages</td>
<td>60</td>
<td>57.4</td>
</tr>
</tbody>
</table>

**Table 3. Histopathology - Dermis**

Dilated and tortuous blood vessels are one of the most characteristic features of psoriasis. Prominent blood vessels were noted in 105 (97.3%) of the cases. Most commonly (64.8%) observed dermal infiltrates were lymphocytes. 34 (31.5%) infiltrates were both lymphocytes and neutrophils 99 (91.7%) participants had normal connective tissue and appendages. Elastolysis and oedema of connective tissue and appendages were noted only in 4 (3.7%) and 5 (4.6%) respectively.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psoriasis vulgaris</td>
<td>93</td>
<td>86.1</td>
</tr>
<tr>
<td>Pustular psoriasis</td>
<td>4</td>
<td>3.7</td>
</tr>
<tr>
<td>Psoriasis with eczematization</td>
<td>4</td>
<td>3.7</td>
</tr>
<tr>
<td>Psoriasis with pustulation</td>
<td>2</td>
<td>2.8</td>
</tr>
<tr>
<td>Guttate psoriasis</td>
<td>2</td>
<td>1.85</td>
</tr>
<tr>
<td>Follicular psoriasis</td>
<td>2</td>
<td>1.85</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 4. Different Variants Encountered in the Study**

**Histopathology**

Parakeratosis is defined as retained nuclei in the stratum corneum layer. Parakeratosis was seen in 106 (98.1%) of cases. Confluent parakeratosis was observed in 62 (57.4%) of cases. Acanthosis was observed in all cases. Elongated bulbous (75%) rete ridges are a characteristic feature of psoriasis. Hyperkeratosis is defined as the thickening of the stratum corneum. It was noted in all the cases. Neutrophil Exocytosis was observed in 66 (61.1%) of cases. Munro Micro Abscess is defined as collection of neutrophils in the stratum corneum layer. It was seen in 41 (38%) of the participants. Spongiosis is the presence of intraepidermal and intercellular oedema. It was noted in 83 (76.9%) of the cases. Regular Acanthosis constituted 79 (73.1%) of cases. Suprappapillary thinning is constituted 83 (76.9%) of the cases. It is one of the defining features of psoriasis. Hypoparakeratosis is defined as the decrease in the granular layer. It was noted in 95 (87.9%) of the cases. Kogoj abscess was observed in 6 (5.6%) of the cases. It is the defined as the collection of neutrophils in the stratum spinosum layer. bulbous rete ridges were noted in most of the cases 81 (74.1%) of the cases. Increased mitotic figures are noted in the basal and spinous layers in psoriasis. It was noted in 80 (74.1%) of the cases.

<table>
<thead>
<tr>
<th>Histopathologic Features</th>
<th>Present (%)</th>
<th>Absent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperkeratosis</td>
<td>108 (100)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Orthokeratosis</td>
<td>0 (0)</td>
<td>108 (100)</td>
</tr>
<tr>
<td>Exocytosis of neutrophils</td>
<td>66 (61.1)</td>
<td>42 (38.8)</td>
</tr>
<tr>
<td>Munro's micro abscess</td>
<td>41 (38%)</td>
<td>67 (62%)</td>
</tr>
<tr>
<td>Spongiosis</td>
<td>83 (76.9)</td>
<td>25 (23.1)</td>
</tr>
<tr>
<td>Papillomatosis</td>
<td>6 (5.5)</td>
<td>102 (94.5)</td>
</tr>
<tr>
<td>Supra papillary thinning</td>
<td>83 (76.9)</td>
<td>25 (23.1)</td>
</tr>
<tr>
<td>Hypoparakeratosis</td>
<td>95 (87.9)</td>
<td>13 (12.04)</td>
</tr>
<tr>
<td>Kogoj abscess</td>
<td>6 (5.6)</td>
<td>102 (94.4)</td>
</tr>
<tr>
<td>Mitotic figures</td>
<td>80 (74.1)</td>
<td>28 (25.9)</td>
</tr>
</tbody>
</table>

**Table 2. Histopathology - Epidermis**

**Correlation with Clinical Diagnosis**

Out of the 217 cases in which a clinical or differential diagnosis of psoriasis were entertained 180 cases were histopathologically proven as psoriasis. It was seen that 64 (36%) out of the 180 cases had a primary clinical diagnosis of psoriasis. In the rest of the cases psoriasis was included only as differential diagnosis. Few of the consistency findings in my study were hyperkeratosis, parakeratosis, regular acanthosis and dilated blood vessels. Munro’s micro abscess, even though a characteristic feature of psoriasis, was observed only in 41 (38%) of the cases.

**DISCUSSION**

**Age**

Mean age of the patients in this study was 44 years. The most common age group of patients was between 31.25 and 55.75 years. The mean age among males was 44.2 yrs and for that of females was 43.7 yrs. In the study conducted by Okhandiar et al, highest incidence was noted in 20 – 39 yrs. & mean age of males & females were comparable.

**Gender**

There were 80 males and 28 females in our study with male to female ratio of 2.9:1. In the study by Kaur et al, Bedi et al, Nikhil Moorchung et al and Okhandiar et al were 2:1, 2.5:1, 1:2:1, 2.46:1, respectively.

**Disease Duration**

In our study, the disease duration ranged from 4 months - 40 years with a mean duration of 6.69 years. In a study by Cemal Bilac, Aylin Turel Ermerctan et al, the duration ranged from 1 month - 40 months with a mean of 12.4 ± 9.9 months.³

**Comorbidities**

In several studies it has been found that psoriasis is associated with a number of behavioural and systemic comorbidities like obesity, hypertension, diabetes, hyperlipidemia, metabolic syndrome, cardiovascular diseases etc. As such it is important to screen for these diseases among psoriasis patients and give prompt treatment. ⁴ In my study, there were 16 patients with diabetes mellitus, 23 with hypertension, 9 had both diabetes mellitus and hypertension, and 7 patients gave history of cardiovascular diseases.

**Clinical Features**

The major clinical features of psoriasis are erythematous scaly plaques, scalp scaling, pruritus, psoriatic arthritis and nail changes which includes onycholysis and subungual hyperkeratosis. The most frequent clinical findings in the present study was erythematous scaly plaques (73 %). There were pustules in 14.8 % and generalized exfoliation in 16.6% of cases, both directing towards diagnosis of variants of psoriasis (Table 4). Clinical Features observed by Bedi et al⁷ and present study when compared Erythematous scaly plaques (90 %) present study (73 %). Scalp scaling (62 %)
Histopathology

Histopathological features pertaining to psoriasis were studied in detail. The cardinal histopathological features of psoriasis include a combination of the following: confluent parakeratosis, regular acanthosis, scattered mitosis of basal and prickle cells, dilatation and tortuosity of dermal capillaries and mild perivascular infiltration with lymphocytes. All the characteristic feature may not be present in one section alone.

Epidermal Changes

The epidermal changes described were hyperkeratosis, confluent parakeratosis and regular epidermal hyperplasia which is known as psoriasiform hyperplasia/ skin reaction pattern. Hyperkeratosis could be identified in 108 (100%) and is one of the commonest histological features described in psoriasis. However, in a study by Puri et al hyperkeratosis was noted in only 64 % of the cases. Parakeratosis was found in 106 (98.1 %) of the cases. Confluent parakeratosis helps to differentiate psoriasis from other psoriasiform reactions like pityriasis rubra pilaris. Among these 57.4 % were confluent parakeratosis and the rest (40.7 %) were focal. In a study done by Nikhil Moorcheng, JS Khullar, Manas Chatterjee, Biju Vasudevan et al, the degree of hyperkeratosis showed a strong correlation with parakeratosis.

Papillomatosis, the surface elevation caused by the hyperplastic epithelium is characteristic of the variant called verrucous psoriasis. It was seen only in 6 cases (5.55 %) and was mild, none of which warranted the special categorization. Regular acanthosis was seen in 79 (73.1 %) of cases. The remainder of 26.9 % of cases had irregular acanthosis. Saw toothed rete ridges forming irregular acanthosis is characteristically described in lichen simplex chronicus and lichen planus. This finding in our study could be due to eczematization or chronic itching.

Hypogranulosis, is due to the increased cell turnover, so that granular layer is thinned out in favour of the para/hyperkeratotic layers. This feature was seen in 95 (97.9 %) of the cases. The rest 13 (12%) did not show marked hypogranulosis. This may be due to treatment effect or due to resolution.

Suprapapillary thinning, another feature representing increased turnover was observed in 83 (76.9 %) of cases. Similarly, mitotic figures were seen in 80 (74.1 %) of cases. The cases with absence of suprapapillary thinning, hypogranulosis and mitosis, probably represents resolving phases of the lesion.

Still other epidermal features include spongiosis with neutrophilic exocytosis and Munro’s micro abscess formation. Spongiosis was seen in 83 (76.9 %) of cases. Psoriasis is primarily spongiotic and it is seen in early lesions and certain specific sites, but it never forms spongiotic vesicles as in eczematous dermatitis. The diagnosis of eczematous dermatitis is preferred over psoriasis when spongiosis is marked, but some cases have been diagnosed as psoriasis with eczematization, since the epidermal hyperplasia and type of inflammatory cell infiltrate favour the latter.

Dermal Changes

Dermis is affected earlier than epidermis in psoriasis. The earliest histopathological change is the dilatation and congestion of vessels in the papillary dermis and a mild, perivascular, lymphocytic infiltrate, with some adjacent edema. In the present study dilated blood vessels were seen in around 105 (97.2 %) of cases accounting for the most consistent feature, following hyperkeratosis. Study by Puri et al showed comparable results.

Correlation with Clinical Diagnosis

Dermatology is a field with immense need for clinicopathological correlation. In the present study, cases diagnosed as psoriasis histopathologically were included. On comparison, it was seen that 38 (36%) of the 108 cases had psoriasis as the primary clinical diagnosis. In the rest of the cases, psoriasis was included only in the differential diagnosis.

Clinically florid cases show characteristic erythema and silvery white scales with Aushitz sign. Atypical or involuting or healed lesions pose diagnostic dilemma to the clinician. Although there is a need for clinical data for histological diagnosis of psoriasis, there are definite histopathological features which separate psoriasis from other papulosquamous diseases. Few of the consistent finding in the study were hyperkeratosis, parakeratosis, regular acanthosis and dilated blood vessels.
**Variants**

There are different clinical variants for psoriasis, including sebopsoriasis, flexural, guttate, erythrodermic and pustular psoriasis. Histopathologically psoriasis vulgaris accounted for 93 (86%) of the cases. The variants encountered in the study were Exfoliative Psoriasis, Pustular Psoriasis, Guttate psoriasis and Follicular psoriasis (Table 4). According a study by Bedi chronic plaque type psoriasis was the most common (90%) clinical phenotype. 26

Four cases of Generalised pustular psoriasis diagnosed histologically by the presence of spongiform pustules of Kogoj; and two cases of guttate psoriasis, by dermal edema is recorded in this study. The importance of clinical data in these cases cannot be overemphasized.

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**CONCLUSIONS**

Psoriasiform lesions appear morphologically similar to the prototypical classical psoriasis. Depending upon the disorder, lesions vary in size, shape, scaling and configuration. However, at times, these lesions pose diagnostic dilemma to the treating clinician. The low incidence of its diagnosis and precise assessment, histopathological evaluation is essential. Moreover, in the context of treatment, it is important to differentiate between the various subtypes of psoriasis. It also has an important role in the follow up of these patients.

Financial or Other Competing Interests: None.

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