

## ORIGINAL ARTICLE

## Histopathological Analysis of Psoriasis

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## DISCLOSURE

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**ABSTRACT**

**Background:** Treatment of psoriasis results in alteration in clinical and histopathology findings with resultant inconclusive histopathology findings and a diagnostic dilemma in resource poor settings. **Objective:** To document the histopathology of clinically correlated psoriasis, compare with other studies and observe any differences in features.

**Methodology:** A retrospective cross-sectional evaluation of 60 cases histopathologically diagnosed as psoriasis was conducted at the ClinaLancet laboratory in Lagos, Nigeria over a 2-week period. Slides of 60 dermatology clinic treatment naive cases diagnosed by dermatologists with histopathological correlation as psoriasis were retrieved, observed under the microscope and the features of psoriasis were documented in a pre-designed proforma. Data was entered into a Microsoft Excel Spreadsheet. Simple means and frequencies were presented.

**Results:** There were 35 females (58.3%) and 25 males (41.7%). The mean age of the patients was  $41.55 \pm 19.03$  years; age range was 1-83 years. The commonly observed features of psoriasis were hyperkeratosis (100%), acanthosis (100%), perivascular infiltrates (100%), parakeratosis (95%), absent granular layer (83.3%), suprapapillary plate thinning (86.7%) and Munro microabscess (45%). The findings were comparable to other studies.

**Conclusion:** The findings from this study are similar to the findings from other histopathology study of psoriasis. Iatrogenic intervention does not significantly change the histopathology features of psoriasis to the extent that a conclusive diagnosis cannot be made.

**Keywords:** Skin biopsy, Dermatopathology, Psoriasis, Skin disease, Parakeratosis, Nigeria

## INTRODUCTION

Psoriasis is a chronic inflammatory skin disease with a worldwide occurrence.<sup>1,2,3</sup> Its prevalence is reported to vary from 0.73 to 2.9%<sup>1,2,3</sup> Psoriasis is an immune dependent process with a genetic predisposition.<sup>4,5</sup> A continuous and sustained inflammation results in uncontrolled proliferation and dysfunctional maturation of keratinocytes.<sup>4</sup> Clinically, psoriasis presents as erythematous scaly papules and plaques.<sup>5,6</sup> Histopathologically, psoriasis is typified by epidermal hyperplasia, dermal telangiectasia, inflammatory infiltrates of neutrophils, dendritic cells, T-Cell lymphocytes and macrophages.<sup>4,5</sup> These features are reported histopathologically as hyperkeratosis, parakeratosis, Munro micro-abscess, acanthosis, spongiotic pustules of Kogoj, dermal oedema, telangiectasia and perivascular infiltrates.<sup>7,8,9,10,11,12,13</sup>

Treatment of psoriasis typically results in changes in both clinical and histopathologic features.<sup>10</sup> Self-medication is common amongst dermatology patients and has been reported in up to 33% of psoriasis patients.<sup>14,15</sup> Prior to dermatology clinic attendance, most psoriasis patients in Nigeria would have had a therapeutic intervention. The result of this practice is a possible alteration in the clinical findings and possibly with a resultant inconclusive histopathology findings and a diagnostic dilemma especially in resource poor countries.<sup>10</sup> Documentation of the histopathology of psoriasis in Nigeria is scarce, prior therapeutic interventions which affects histological findings may adversely affect this too.

The aim of this study was to conduct a retrospective evaluation of the features of histopathologically diagnosed psoriasis from skin biopsies submitted by only board certified dermatologists. It is the author's hypothesis that, features consistent with psoriasis will still be present in the samples despite suspected iatrogenic interventions.

## METHODOLOGY

A retrospective cross-sectional evaluation of 60 cases histopathologically diagnosed as psoriasis from 1st January, 2017 to 31st August, 2021 was conducted at a private laboratory. Permission for the study was obtained from the operators of the laboratory. The study was conducted at the ClinaLancet laboratory in Lagos, Nigeria. The ClinaLancet laboratory is an international laboratory with a dermatopathologist and two surgical pathologists manning the histopathology section. The specimens were evaluated by the dermatopathologist.

A list of all board certified dermatologists who send samples to the laboratory was retrieved from the data base of the laboratory. The dermatologists were asked about the interval between discontinuation of treatment and the conduct of skin biopsies. Skin biopsies performed 2-3 weeks after discontinuation of the treatment to limit changes in the histopathology features were selected. The biopsy samples were fixed in 10% formalin, subjected to tissue processing after fixation and stained with haematoxylin and eosin.

Slides of 60 cases diagnosed by these dermatologists with histopathological correlation as psoriasis were retrieved,

observed under the microscope and the features documented in a pre-designed proforma. Only cases diagnosed as psoriasis by board certified dermatologists with histopathological correlation were included in the study. There were 66 cases of correlated psoriasis during the study period. Six of the cases were not evaluated as a result of incomplete data and poor slide preparation.

Prior to the study, the dermatopathologist and the surgical pathologist who conducted the study met to decide on the definition of and the features to look out for. The slides were retrieved and studied based on agreed diagnostic criteria. In this study, histopathology features of psoriasis were documented according to literature.<sup>8,11,12</sup> These features are:

Monro micro-abscesses: neutrophilic collections in the stratum corneum.

Hyperkeratosis: thickening and loss of the normal basket weave appearance of the stratum corneum.

Parakeratosis: retention of nucleated keratinocytes in the stratum corneum.

Absent granular layer: when no keratohyalin granule containing Stratum granulosa is observed.

Hypogranular layer: when only one layer as opposed to the normal 2-3 layers is observed in the stratum granulosa.

Acanthosis: increased thickness of epidermis.

Spongiotic pustules of Kogoj: collections of neutrophils in the stratum spinosum.

Suprapapillary plate thinning: thinning of the granular layer at the tips of the papillae.

Telangiectasia: proliferation and dilatation of the capillaries in the papillary dermis.

Superficial dermal oedema: pallor of the papillary dermis due to oedema.

Superficial dermal perivascular infiltrates of lymphocytes and histiocytes.

The age, gender, duration and histopathology features of all the cases were recorded in a

Microsoft Excel Spreadsheet. Simple proportions and percentages are presented.

## RESULTS

Sixty histopathologically proven cases were analysed. The cases were made up of 35 females (58.3%) and 25 males (41.7%). The mean age of the patients was  $41.55 \pm 19.03$  years; age range was 1-83 years. The duration of psoriasis was not stated in 24 of the cases. Amongst those in whom the duration was stated, the mean duration was  $3.22 \pm 3.36$  years (range of 3 months to 12 years).

The commonly observed features of psoriasis were hyperkeratosis, parakeratosis, acanthosis, telangiectasia and inflammatory infiltrates. Details are as depicted in Table 1.

Compared to previous studies, hyperkeratosis, absent granular layer and papillary oedema were observed more in the present study (Table 2).

**Table 1.** Histopathology of psoriasis

| Histological Features         | Number of cases (n = 60) | %    |
|-------------------------------|--------------------------|------|
| Hyperkeratosis                | 60                       | 100  |
| Parakeratosis                 | 57                       | 95   |
| Suprapapillary plate thinning | 52                       | 86.7 |
| Munro micro-abscesses         | 27                       | 45   |
| Spongiotic pustule of Kogoj   | 4                        | 6.7  |
| Absent granular layer         | 50                       | 83.3 |
| Hypergranular layer           | 1                        | 1.7  |
| Hypogranular layer            | 11                       | 18.3 |
| Acanthosis                    | 60                       | 100  |
| Papillary oedema              | 59                       | 98.3 |
| Telangiectasia                | 60                       | 100  |
| Perivascular infiltrates      | 60                       | 100  |

**Table 2.** Comparison of histopathology features with other studies

| Histopathological changes     | Puri <i>et al.</i> , <sup>8</sup> (2012) (%)<br>n=16 | Karumbaiah <i>et al.</i> , <sup>10</sup> (2014) (%)<br>n=22 | Hosamane <i>et al.</i> , <sup>11</sup> (2014) (%)<br>n=42 | Pandit & Narayankar, <sup>7</sup> (2015) n=42 | Ukonu <i>et al.</i> , <sup>9</sup> (2020) n=25 | Mehta <i>et al.</i> , <sup>13</sup> (2009) n=61 | Present study (2021) n=60 |
|-------------------------------|------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------|------------------------------------------------|-------------------------------------------------|---------------------------|
| <b>Epidermis</b>              |                                                      |                                                             |                                                           |                                               |                                                |                                                 |                           |
| Hyperkeratosis                | 56.25                                                | 77.27                                                       | 28.57                                                     | 23.80                                         | 15.80                                          | -                                               | 100.00                    |
| Parakeratosis                 | 87.50                                                | 72.72                                                       | 61.90                                                     | 100.00                                        | 73.70                                          | -                                               | 95.00                     |
| Acanthosis                    | 81.25                                                | 86.36                                                       | 90.47                                                     | 97.61                                         | 68.40                                          | 54.00                                           | 100.00                    |
| Suprapapillary plate thinning | 25.00                                                | 40.90                                                       | 35.71                                                     | 95.23                                         | -                                              | -                                               | 86.70                     |
| Elongated rete ridges         | 81.25                                                | 72.72                                                       | -                                                         | 86.71                                         | 84.20                                          | 9.00                                            | -                         |
| Munro microabscess            | 43.75                                                | 22.72                                                       | 26.19                                                     | 83.33                                         | 5.30                                           | 38.00                                           | 45.00                     |
| Spongiform pustule of Kogoj   | -                                                    | 4.54                                                        | 11.90                                                     | 11.90                                         | -                                              | -                                               | 6.70                      |
| Hypo/absent granular layer    | 25.00                                                | 22.72                                                       | 19.04                                                     | 92.85                                         | -                                              | -                                               | 18.30                     |
| Absent granular layer         | 56.25                                                | -                                                           | -                                                         | -                                             | -                                              | 51.00                                           | 83.30                     |
| Hypergranulosis               | -                                                    | -                                                           | -                                                         | -                                             | 0.00                                           | -                                               | 1.70                      |
| <b>Dermis</b>                 |                                                      |                                                             |                                                           |                                               |                                                |                                                 |                           |
| Papillary oedema              | -                                                    | 27.27                                                       | 19.04                                                     | -                                             | -                                              | -                                               | 98.30                     |
| Vascular changes              | 50.00                                                | 86.36                                                       | 14.28                                                     | 97.61                                         | 5.30                                           | 53.00                                           | 100.00                    |
| Perivascular infiltrates      | 62.75                                                | 81.81                                                       | 66.66                                                     | 100.00                                        | 5.30                                           | -                                               | 100.00                    |

## DISCUSSION

Histopathological features of psoriasis although well-known are scarcely documented.<sup>8,9,11</sup> The few studies that have been documented show varying proportions of the histopathological features of psoriasis depending on the duration of disease, clinical features and treatment.<sup>7,8,9,10,11,12,13</sup>

This study differed in demographics compared with similar studies with a female preponderance and a higher mean age.<sup>7,8,12</sup> The commonly observed histopathology features were hyperkeratosis, parakeratosis, acanthosis, thin suprapapillary plates, absent granular layer, papillary oedema, telangiectasia and inflammatory infiltrates. In a few patients, Munro micro-abscesses, hypogranular layer and spongiotic pustule of

Kogoj were seen. The features observed in this study are consistent with the histopathological features which typify psoriasis.<sup>7,8,9,10,11,12,13</sup>

On comparison with previous similar studies, we observed a few differences. Hyperkeratosis was more prominent in this study. The authors opine that the delay in clinical presentation by the patients may have caused this as the mean duration of psoriasis in this study was more than 3 years.<sup>7,8,9,10,11</sup> Munro microabscess which is said to be confirmatory for psoriasis was found in less than half the patients studied. This finding was similar to that in three of the other studies<sup>8,10,11</sup> but at variance with the studies by Pandit *et al.* and Ukonu *et al.*<sup>7,9</sup> Ukonu *et al.* reported less parakeratosis, acanthosis, thin

suprapapillary plates, vascular changes and perivascular infiltrates but similar hypergranulosis as this study.<sup>9</sup> Puri *et al.* reported a similar percentage of parakeratosis, absent/hypogranular layer but fewer vascular changes, perivascular infiltrates and acanthosis.<sup>8</sup> Pandit *et al.* differed from our study by having a higher number of patients with hyperkeratosis and hypo/absent granular layer.<sup>7</sup> Karumbaiah *et al.* and Hosamane *et al.* had a lower number of patients who had epidermal and dermal changes.<sup>10,11</sup> The prominence of the different histopathology features of psoriasis differ depending on when in the evolution of the lesion a biopsy is done. The variations in features from the different studies can be explained by this fact.

The findings from this study are similar to the findings from other histopathology study of psoriasis. It may imply that iatrogenic intervention does not significantly change the histopathology features of psoriasis to the extent that a conclusive diagnosis cannot be made.

The study was limited by not being able to separate acute from chronic psoriasis making comparison of features difficult.

## CONCLUSION

Diagnostic histopathological features of psoriasis can still be found despite iatrogenic interventions.

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