

## PECULIARITIES OF PSORIASIS IN A BLACK AFRICAN COHORT: A HISTOPATHOLOGIC STUDY

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### ABSTRACT

**Background:** Clinical and histopathologic observations have indicated that psoriasis is not rare in our population as previously thought. The initial rarity also led to paucity of studies on the disorder including histopathologic features in our practice setting. To date, there is no report on the histopathologic features of psoriasis indigenous to our practice environment.

**Objective:** To evaluate the frequency of occurrence of the various histopathologic features of psoriasis in patients from this environment and identify any peculiarities that exist in black African patients.

**Methods:** A cross-sectional study of patients diagnosed clinically with psoriasis at the University College Hospital, Ibadan between January 2015 and October 2016. After baseline sociodemographic data, all patients had baseline clinical examination and were offered skin biopsy after obtaining informed consent. The biopsy specimen was examined for histopathologic features of psoriasis after routine processing and staining using a pretested proforma with the frequencies of each diagnostic feature reported in percentages.

**Results:** Forty-four patients with plaque psoriasis were analyzed. The mean age of the patients studied was  $39.84 \pm 20.97$  years with a male to female ratio of which was almost equal. The most consistent epidermal changes in decreasing order of frequency were acanthosis, hypogranulosis, hyperkeratosis followed by elongation of rete ridges while dermal features were dermal infiltration by inflammatory cells, and dilatation of superficial dermal vessels. Munro's microabscesses were found in less than half of the patients biopsied. Some of the patients were found to have atypical changes.

**Conclusions:** Histopathological features of psoriasis in the study is similar to what has been previously established universally but typical features such as Munro's micro abscesses and Kogoj's spongiform pustules are less frequently seen than expected. Atypical changes such as dermal melanophages and periadnexal infiltration by inflammatory cells may also be seen.

**Keywords:** Psoriasis, Histopathology, Nigeria, Black

### INTRODUCTION

Recent reports have indicated that psoriasis is not as uncommon in our population as previously thought.<sup>1-5</sup> Previous experience of its rarity was faced with paucity of studies on the disorder including description of its histopathologic features in this environment. Typical histopathological features of psoriasis have been described in various populations but till date, there has been no report on the histopathological features of psoriasis in West African population. As diagnosis is increasingly made, there will be an increase in demand for histopathologic support in some cases. The need to describe the histopathologic features of psoriasis in our practice setting as a future guide in pathologic diagnosis and descriptions cannot be

overemphasized. In this study, we evaluated the frequency of occurrence of the various histopathologic features of psoriasis in patients from this environment and to compare with reports from other populations so as to identify the uniqueness and peculiarities in black African patients.

### METHODS

The study was a cross sectional study of patients diagnosed with psoriasis at the dermatology clinic or that were admitted into the medical wards of University College Hospital, Ibadan, Nigeria between January 2015 and October 2016.

### Ethical issues

Ethical clearance for the study was obtained from the joint University of Ibadan/University College Hospital, Ibadan, Nigeria Ethical Review Committee (UI/EC/14/0341). Furthermore, this study was conducted in compliance with the guidelines of the Helsinki declaration on biomedical research in human subjects. Confidentiality of the identity of the patients and personal health information was maintained.

Consecutive patients were recruited after obtaining an informed consent. Diagnosis of psoriasis was made on clinical grounds after examination by a dermatologist. Patients excluded from the study were patients who declined a skin biopsy, patients who had been on topical or systemic medication consistently for at least a month prior to presentation. Baseline socio-demographic data and clinical history such as symptoms and onset of the disorder were documented. Skin biopsy specimen from the advancing edge of an active lesion on any involved site was taken after an informed consent was obtained and prior to commencement of anti-psoriatic medications. Sample was sent for routine fixing, sectioning, and examination under light microscopy after haematoxylin and eosin staining. The presence of the various epidermal and dermal features of psoriasis were assessed and documented in each patient using a proforma (Table 1).

### Statistical analysis

Data was analyzed with SPSS 15.0 (IBM, Armonk, NY) with the frequencies of occurrence of each feature reported in percentages. A comparison of the features was done between the two sexes to identify if any differences exist. Chi square or Fischer's test was used to analyze significance between categorical variables where appropriate while t-test was used for differences between means with significance level put at  $p < 0.05$ .

## RESULTS

A total of sixty-three patients were seen over the study period but only 48 (76.2%) gave consent for biopsy and had histopathologic assessment of the biopsies. Twenty-three were males giving an almost equal male

**Table 1:** Proforma for psoriasis histologic report

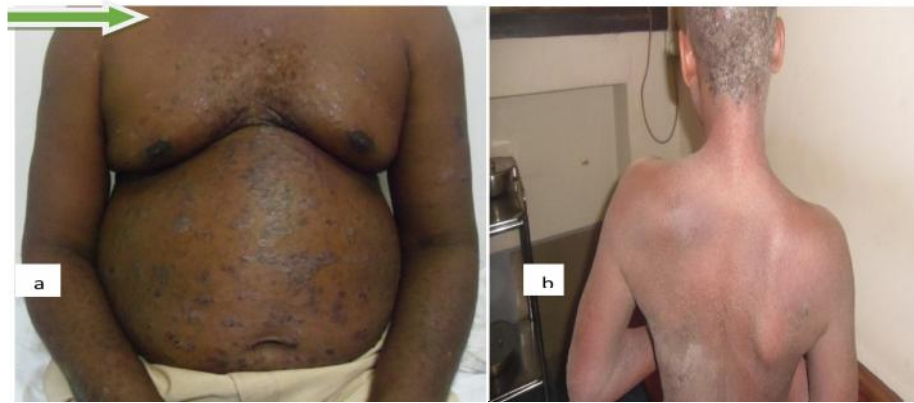
<b>I. Epidermal Changes</b>	
1. Hyperkeratosis	
2. Parakeratosis	
	a) Uniform
	b) Patchy
	c) Absent
3. Munro microabscess	
4. Granular layer	
	a) Absent
	b) Thinned
	c) Normal
5. Spongiosis	
6. Acanthosis	
	a) Regular acanthosis
	b) Irregular acanthosis
7. Papillomatosis	
8. Elongation of rete ridges	
9. Suprapapillary thinning	
<b>II. Dermal Changes</b>	
1. Infiltrate Type	
	a) Acute infiltrate
	b) Chronic infiltrate
	c) Mixed infiltrate
	d) None
2. Perivascular infiltration	
3. Dilatation of capillaries	
4. Tortuous blood vessels	

to female ratio. Majority (79.2%) of the patients were adults with a mean age of  $39.84 \pm 20.97$  years (range 6 – 86 years)

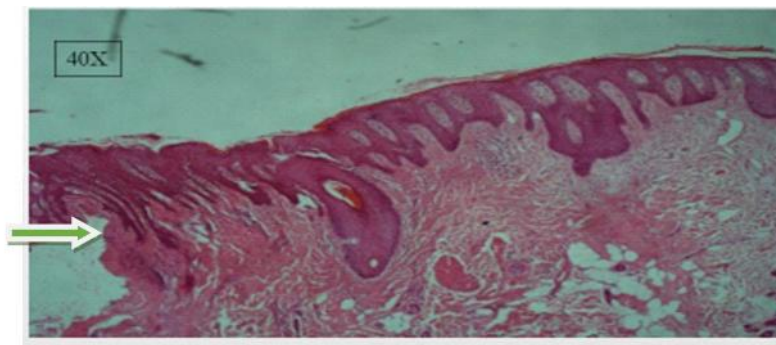
Out of the 48, plaque psoriasis was the most frequent presentation in 44, two had erythrodermic psoriasis with pustular and guttate psoriasis observed in a patient each (Fig. 1). In view of absolutely few number of other clinical types, only histologic reports of patients with plaque psoriasis was analyzed (Fig. 2 & 3). The mean age of the patients with plaque psoriasis was  $40.9 \pm 21.3$  years with a median age of 39.0 (interquartile range 22.0 – 57.5) years and a male: female ratio of 0.9: 1. The mean age of onset and median duration of rash prior to presentation of both sexes are shown in Table 2.

**Table 2:** Distribution of patients' age of onset and time of presentation

	<b>Male (years)</b>	<b>Female (years)</b>	<b>P value</b>
Mean Age at presentation in years (s.d)	44.0 (23.1)	38.1(19.7)	0.350
Median age at presentation in years (iqr)	39.0 (22 – 57.5)	37.5 (19.3-50.8)	0.381
Mean age of onset in years (s.d)	36.7 (21.0)	36.8 (19.4)	0.347
Median age of onset in years (iqr)	37.0 (21.0-55.0)	36.0 (19.0-49.0)	0.899
Median duration of symptom in years	4	0.83	0.004



**Fig 1:** (a) Chronic plaque psoriasis (b) Erythrodermic psoriasis



**Fig 2:** Histopathology of plaque psoriasis showing regular acanthosis with elongation of rete ridges and suprapapillary thinning

**Table 3:** Frequencies of different histologic features of psoriasis (N = 44)

Description	Frequency	Percentage of Total
Hyperkeratosis	35	79.5
Parakeratosis	32	72.7
Hypogranulosis	42	95.5
Thinned	(28/42)	(66.7)
Absent	(14/42)	(33.3)
Acanthosis	43	97.7
Regular	(36/43)	(83.7)
Irregular	(7/43)	(16.3)
Munro's microabscess	21	47.7
Spongiform pustules of Kogoj	6	13.6
Elongation of rete ridges	36	81.8
Clubbing	33	75.0
Suprapapillary thinning	29	65.9
Spongiosis	10	22.7
Papillomatosis	2	4.5
Dermal Infiltrate	43	97.7
Acute	(0/43)	(0.0)
Chronic	(27/43)	(62.8)
Mixed	(16/43)	(37.2)
Dilatation of vessels	25	56.8
Periadnexal infiltration	2	4.5
Dermal melanophages	5	11.4

The frequencies of each histologic feature in all the patients with plaque psoriasis as shown in Table 3 reveals that the most consistent epidermal changes in decreasing order of frequency were acanthosis,

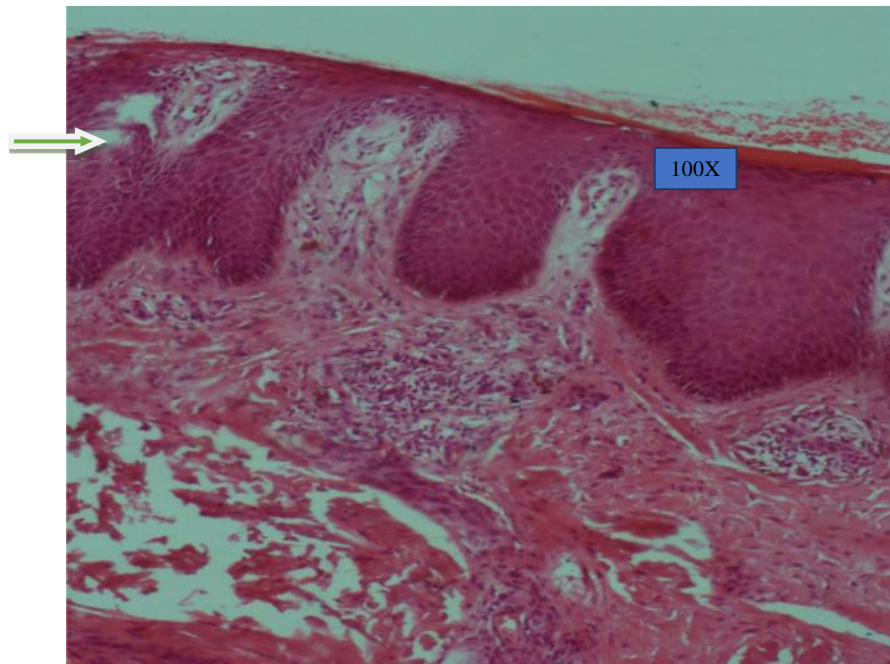
hypogranulosis, elongation of rete ridges and hyperkeratosis while those of the dermis were dermal infiltration by inflammatory cells, and dilatation of vessels. Suprapapillary thinning of the epidermis was

**Table 4:** Comparison of each histologic features of psoriasis in the two genders

Description	Male		Female		P value
	Frequency		Frequency		
Hyperkeratosis					
Yes	19		16		0.137
No	2		7		
Parakeratosis					
Yes	15		17		0.853
No	6		6		
Hypogranulosis					
Yes	19		23		0.222
Thinned		(16/19)		(12/23)	
Absent		(3/19)		(11/23)	
No	2		0		
Acanthosis					
Yes	20		23		0.477
Regular		(17/20)		19/23	
Irregular		(3/20)		4/23	
No	1		0		
Munro's microabscess					
Yes	5		16		0.002
No	16		7		
Elongation of rete ridges					
Yes	18		18		0.701
No	3		5		
Clubbing					
Yes	14		19		0.303
No	7		4		
Suprapapillary thinning					
Yes	12		17		0.241
No	9		6		
Spongiosis					
Yes	5		5		0.870
No	16		18		
Papillomatosis					
Yes	1		1		1.000
No	20		22		
Dermal Infiltrate					
Yes	20		23		0.477
Acute		(0/20)		(0/23)	
Chronic		(15/20)		(12/23)	
Mixed		(5/20)		(11/23)	
No	1		0		
Dilatation of vessels					
Yes	12		13		0.494
No	9		10		
Periadnexal infiltration					
Yes	0		2		0.489
No	21		21		
Dermal melanophages					
Yes	3		2		0.658
No	18		21		

observed in a significant number (65.7%) while Munro's microabscess was found in less than half (47.7%) of the patients biopsied. Six patients (11.7%) were found to have dermal melanophages with no basal cell layer vacuolation and periadnexal infiltration was also seen in a few (4.5%).

Comparatively, the histologic features in both sexes were the same except for the observation that Munro's microabscesses occurred more frequently in females compared to males with p value of 0.02, (Table 4).



**Fig 3:** Histopathology of plaque psoriasis showing hyperkeratosis, hypogranulosis, regular acanthosis, suprapapillary thinning, dilated capillaries and dermal infiltration by chronic inflammatory cells

## DISCUSSION

The characteristic features of a psoriatic lesion as described in other races consists of both epidermal and dermal changes. The histologic appearance of a psoriatic lesion has been observed to follow an evolutionary change with age of the lesion. At onset of a lesion, the dermal changes are believed to precede the appearance of epidermal changes.<sup>6</sup> The early dermal changes include vasodilatation, papillary oedema and leukocyte infiltration which is followed by compact hyperkeratosis, disappearance of the granular layer and slight epidermal hyperplasia.<sup>6,7</sup> As lesions advances especially at the margins of a well-established enlarging plaque, the histology shows: (a) acanthosis with regular elongation of the rete ridges and thickening in their lower portion; (b) epidermal thinning at the suprapapillary region with the occasional presence of small spongiform pustules; (c) epidermal pallor especially in the upper layers; (d) reduced to absent granular layer; (e) confluent parakeratosis; (f) presence of Munro's microabscesses; (g) elongation and edema of the dermal papillae; and (h) dilated and tortuous capillaries.<sup>8,9</sup>

In our study, all of the above features were observed in varying proportions. In patients from this region, acanthosis, hypogranulosis, elongation of rete ridges and hyperkeratosis were the commonest epidermal changes while dermal infiltration and dilatation of the vessels were frequent dermal changes. This was comparatively like studies in some other population. In a study of psoriatic patients in Saudi Arabia, 75%

had regular psoriasiform epidermal hyperplasia, 70% had collection of neutrophils in the corneal layer (Munro's microabscess), 62% of the biopsies showed papillary dermal edema and dilated blood vessels while 40% only revealed loss of granular cell layer.<sup>10</sup> In another study in Pakistan, all the cases showed moderate to marked acanthosis and hyperkeratosis while attenuated or absent granular layer, suprapapillary thinning and parakeratosis were also seen in majority of patients<sup>11</sup> similar to our study. However, the different proportion at which each histologic feature occurred in various reports is understandable. This is because all the characteristic features may not be present in one section alone and histologic features of psoriasis may vary from individual to individual, with duration of lesion and from lesion to lesion in the same individual. This made Trozak in 1994 to suggest a histologic grading system for psoriasis which did not gain universal acceptability and utilization.<sup>12</sup>

Theoretically, dilated blood vessels, regular epidermal hyperplasia, and presence of Munro's micro abscess and/or Kogoj's abscess have been described (or are agreed) to be the most constant or characteristic histopathological features in skin biopsy of psoriasis<sup>13</sup> but a study on clinico-histopathologic correlation found in addition, suprapapillary thinning and absence of granular layer as histological features that could be added to the list of essential histopathological criteria for psoriasis as observed also in this study.<sup>14</sup> However, less than half of the patients in this study had Munro's

micro abscess which is highly suggestive of psoriasis. Compared to other studies and reports from other regions, Munro's micro abscesses and Kogoj's spongiform pustules were seen in a lower proportion in this study. One may thus suggest that Munro's micro abscess is less frequently found in psoriatic lesions in our environment and diagnosis of psoriasis should still be entertained when other characteristic features are present in the absence of Munro's micro abscesses and Kogoj's spongiform pustules.

Interestingly, Munros microabscesses were observed to be more frequent in females for reasons that are still uncertain ( $p = 0.002$ ). It is possible that the earlier presentation in females compared to males ( $p = 0.004$ ) may be responsible for these differences but unfortunately the age of each lesion biopsied were not documented nor assessed. Finally, a few of the patients were observed to have dermal melanophages and this might account for the post inflammatory dyspigmentation that occurs in some of our patients. The periadnexal inflammation observed in some patients may explain the associated hair loss found in some patients

#### Limitations of Study

1. The age of the lesion biopsied was not documented to assess its influence on histology of lesion due to patient not been able to give a good history of the lesions.

#### CONCLUSION

Histopathological features of psoriasis in patients from West Africa is similar to what has been previously established universally but typical features such as Munro's micro abscesses and Kogoj's spongiform pustules are less frequently seen than expected. I suggest histologic diagnosis of psoriasis should be considered when Munro's microabscesses are absent and the other more common features in keeping with psoriasis are present.

Atypical changes such as dermal melanophages and periadnexal infiltration by inflammatory cells may also occur in some patients.

#### REFERENCES

1. **Akinboro AO**, Mejiuni AD, Akinlade MO *et al*. Spectrum of skin diseases presented at LAUTECH

- Teaching Hospital, Osogbo, southwest Nigeria. *International journal of dermatology*. 2015;54 (4): 443-450.
2. **Henshaw EB**, Olasode OA. Skin diseases in Nigeria: the Calabar experience. *International journal of dermatology*. 2015;54(3):319-326.
  3. **Ogunbiyi AO**, Daramola OO, Alese OO. Prevalence of skin diseases in Ibadan, Nigeria. *International journal of dermatology*. 2004;43 (1): 31-36.
  4. **Obasi OE**. Psoriasis vulgaris in the Guinea Savannah region of Nigeria. *International journal of dermatology*. 1986;25(3):181-183.
  5. **Jacyk WK**. Psoriasis in Nigerians. *Tropical and geographical medicine*. 1981;33(2):139-142.
  6. **De Rosa G**, Mignogna C. The histopathology of psoriasis. *Reumatismo*. 2007;59 Suppl 1:46-48.
  7. **Camisa C**. Handbook of psoriasis: John Wiley & Sons; 2008.
  8. **Gordon M**, Johnson WC. Histopathology and histochemistry of psoriasis. I. The active lesion and clinically normal skin. *Archives of dermatology*. 1967;95(4):402-407.
  9. **Elder D**, Elenitsas R, Jaworsky C *et al*. Lever's Histopathology of the Skin. *Archives of Pathology and Laboratory Medicine*. 1998;122 (3): 288.
  10. **Alhumidi AA**. Retrospective 10 years review of 100 patients with psoriasis in the Kingdom of Saudi Arabia (KSA).
  11. **Bhat A**. A comparative study of histopathological changes seen in chronic plaque psoriasis, before and after treatment with narrow band ultraviolet B in Indian patients: *Rajiv Gandhi University of Health Sciences*; 2011.
  12. **Trozak DJ**. Histologic grading system for psoriasis vulgaris. *International journal of dermatology*. 1994; 33(5):380-381.
  13. **Mobini N**, Toussaint S, Kamino H. Noninfectious erythematous, papular, and squamous diseases. *Lever's Histopathology of the skin 9th ed* Philadelphia (PA): Lippincott Williams & Wilkins. 2005:179-214.
  14. **Mehta S**, Singal A, Singh N, Bhattacharya SN. A study of clinicohistopathological orrelation in patients of psoriasis and psoriasiform dermatitis. *Indian J Dermatol Venereol Leprol*. 2009;75 (1): 100.