Histopathologic Findings of Psoriatic Lesions of Patients Accessing Care at Ospital ng Manila Medical Center, Manila, Philippines: A Five Year Retrospective Study (2010-2015)

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Abstract

INTRODUCTION Psoriasis is a chronic, immune-mediated polygenic skin disorder characterized by epidermal hyperplasia. Cardinal histopathological features are as follows: hyperkeratosis, parakeratosis, neutrophils in the stratum corneum and spinous layer, hypogranulosis with suprapapillary thinning, acanthosis, clubbed rete ridges, dilated capillaries, and perivascular lymphocytes. As histopathology may be more definitive compared to clinical manifestations, being able to diagnose psoriasis accurately through histopathology may enable early diagnosis and treatment. This could ideally mean a decrease in its progression, prevention of complications, and improvement of quality of life for psoriatic persons.

OBJECTIVES To examine, grade, and compare histopathologic findings of psoriatic lesions with established parameters from previous literature.

METHODS This is a retrospective descriptive study that will examine, grade, and compare all histopathologic findings of psoriatic lesions of patients who have accessed care at Ospital ng Manila Medical Center from 2010-2015 with established parameters from previous literature.

RESULTS All 41 cases (100%) showed parakeratosis, followed in decreasing order by 19 cases (46.34%) with Munro's microabscesses, 15 cases (36.59%) with pustules of Kogo, 15 cases (36.59%) with hypogranulosis, and 11 cases (26.83%) with spongiosis. Using the visual analogue scale of Moorchung N *et al* (2013), 28 cases (68.29%) showed mild inflammatory infiltrates, followed in decreasing order by 19 cases (46.34%) with mild epidermal hyperplasia, 12 cases (29.27%) with mild capillary proliferation, and 4 cases (9.77%) with mild suprapapillary thinning.

CONCLUSIONS Findings of the current study showed histopathologic features of both early and fully developed lesions based on established psoriasis histopathological parameters. Recognized histopathological features were not consistently found in well-developed lesions.

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INTRODUCTION

Psoriasis is a chronic, immune-mediated, polygenic skin disorder characterized by epidermal hyperplasia ([7]). Various environmental triggering factors may elicit this papulosquamous disease including trauma, infections or medications. The characteristic psoriatic lesion is a sharply demarcated erythematous plaque with micaceous scale commonly over the scalp, elbows and knees, followed by the nails, hands, feet and trunk. Lesions may be localized or widespread in distribution.

The pathology of psoriasis involves T cells and their interactions with dendritic cells and keratinocytes amongst other cells involved in innate immunity. Identification of susceptibility genes has pointed to a major role for both the innate and the adaptive immune systems ([7]).

The cardinal histopathological features of psoriasis are as follows: hyperkeratosis with confluent parakeratosis, neutrophils in the stratum corneum (Munro microabscesses) and in the spinous layer (spongiform pustules of Kogoj), hypogranulosis with suprapapillary thinning, regular acanthosis, clubbed rete ridges, dilated capillaries, and perivascular lymphocytes ([10]).

Psoriasis is a systemic disease process as well with an estimated 20–30% of patients developing psoriatic arthritis. For patients with moderate to severe psoriasis, previous literature has described an increased relative risk for metabolic syndrome and cardiovascular disease ([7]). Phototherapy, methotrexate, cyclosporine and biologic therapies that target key immune effector cells and cytokines have been lead to significant clinical improvement.

SIGNIFICANCE OF THE STUDY

Despite the characteristic clinical manifestations of psoriasis, occasionally atypical cases are presented in the clinical setting making its diagnosis difficult. This emphasizes the importance to undertake the histopathological examination of psoriasis. As histopathology may be more definitive in its diagnosis compared to clinical manifestations, being able to diagnose psoriasis accurately through histopathology may enable early diagnosis and treatment. This could ideally mean a decrease in its progression, prevention of complications, and improvement of quality of life for psoriatic persons.

OBJECTIVES OF THE STUDY

General Objective:

1. Determine the histopathologic findings of lesions of psoriatic patients

Specific Objectives:

1. Determine the concordance between the histopathologic findings of psoriatic lesions of patients and established psoriasis histopathological parameters
2. Deteremine the grade of the histopathologic parameters of psoriatic lesions of patients using the visual analogue scale of Moorchung N, Khullar JS, Mani NS, *et al* (2013) ([4])

MATERIALS AND METHODS

Study Design

The study design is hospital based retrospective study conducted in the Department of Dermatology, Ospital ng Maynila Medical Center, Manila, Philippines.

Ethical clearance to access the medical records of the patients with psoriasis was obtained from the Research Consultant of the Department of Dermatology, Ospital ng Maynila Medical Center.

Subject Selection

All cases that were diagnosed as Psoriasis on histopathology from June 2010 to June 2015 at

the Department of Dermatology, Ospital ng Maynila Medical Center, were included in the study. Exclusion criteria included (a) patients with uncontrolled bacterial, viral, or fungal infection at the time of skin punch biopsy and (b) patients on concomitant use of any topical medications at the time of skin punch biopsy.

Study Procedure

The histopathologic specimens and clinical charts of psoriatic patients at the Department of Dermatology, Ospital ng Maynila Medical Center from June 2010 to June 2015 were manually retrieved and reviewed. Relevant data were collected. A total of 41 patients were seen and treated after having undergone skin punch biopsy for histopathological confirmation. Clinical charts were reviewed for age and sex. Histopathologic specimens were reviewed for nine parameters (epidermal hyperplasia, parakeratosis, Munro's micoabscesses and pustules of Kogo, hypogranulosis, spongiosis, suprapapillary thining, inflammatory infiltrate, and capillary proliferation). Grading was done using a visual analogue scale and specimens were graded as 1 to 3 (Moorchung N, Khullar JS, Mani NS, *et al,* 2013) ([4]).

Epidermal hyperplasia

Defined as thickening of the stratum corneum. Graded on a scale (a) Grade 1 - mild (b) Grade 2 - moderate (c) Grade 3 - marked. (Figure 1)

Parakeratosis

Defined as the presence of keratinization with retained nuclei in the stratum corneum. Graded as (+) present or (-) absent. (Figure 2A)

Munro's microabscesses and pustules of Kogo

Defined as the presence of collections of neutrophils in the corneal layer and the stratum spinosum, respectively. Graded as (+) present or (-) absent. (Figure 3A & 3B)

Hypogranulosis

Defined as decreased thickness of the stratum granulosum. Graded as (+) present or (-) absent. (Figure 2B)

Spongiosis

Defined as intercellular edema between keratinocytes in the epidermis. Graded as (+) present or (-) absent. (Figure 2C)

Suprapapillary thinning

Defined as thinning of the stratum granulosum at the tips of the papillae. The elongation of rete pegs was also considered. Graded on a scale (a) Grade 1 - mild (b) Grade 2 - moderate (c) Grade 3 – marked. (Figure 4)

Inflammatory infiltrate

Defined as the degree of the inflammatory infiltrate in the dermis. Graded on a scale (a) Grade 1 - mild (b) Grade 2 - moderate (c) Grade 3 – marked. (Figure 5)

Capillary proliferation

Defined as the proliferation and dilatation of the capillaries at the tips of the papillae. Graded on a scale (a) Grade 1 - mild (b) Grade 2 - moderate (c) Grade 3 - marked. (Figure 6)

Statistical Analysis

The data was entered and tallied using SPSS software version 17.0. Descriptive statistics were generated for all variables. For nominal data, frequencies and percentages were computed.

RESULTS

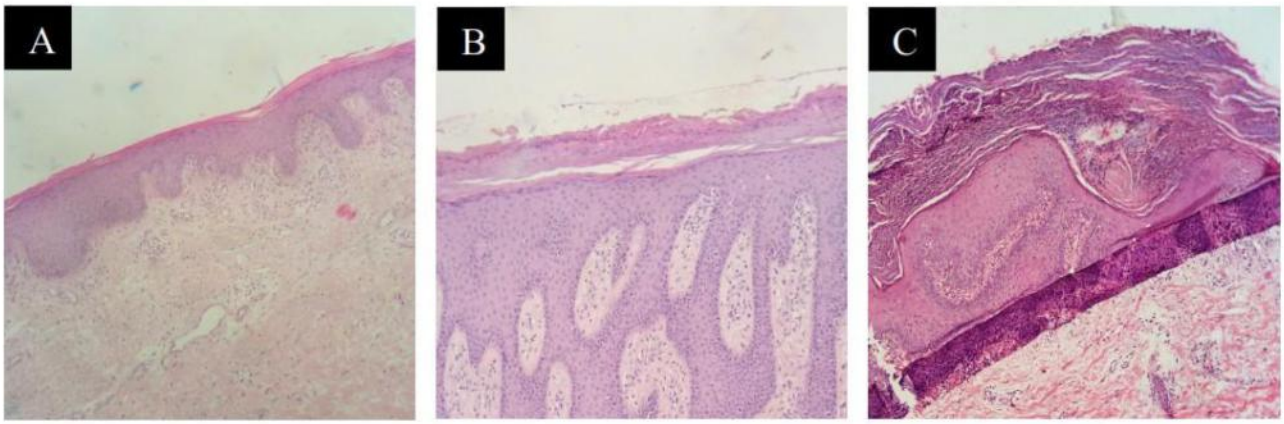
A total of 41 patients with a histopathological diagnosis of Psoriasis was retrieved from the clinical records. Table 1 shows the distribution of the psoriatic patients according to histological parameters. Nineteen cases (46.34%) showed mild epidermal hyperplasia, 18

cases (43.90%) were moderate, and 4 cases (9.77%) were marked. (Figure 1) All 41 cases (100%) showed parakeratosis (Figure 2A), followed by (in decreasing order) 19 cases (46.34%) with Munro's microabscesses (Figure 3A), 15 cases (36.59%) with pustules of Kogo (Figure 3B), 15 cases (36.59%) with hypogranulosis (Figure 2B), and 11 cases (26.83%) with spongiosis (Figure 2C). Four cases (9.77%) showed mild suprapapillary thinning, 19 cases (46.34%) were moderate, and 18 cases (43.90%) were marked (Figure 4). Twenty-eight cases (68.29%) showed mild inflammatory infiltrates, 2 cases (4.88%) were moderate, and 11 cases (26.83%) were marked (Figure 5). Twelve cases (29.27%) showed mild capillary proliferation, 9 cases (21.95%) were moderate, and 20 cases (48.78%) were marked. (Figure 6) [Table 1]

Table 1. Distribution of Psoriatic Patients According to Histological Parameters

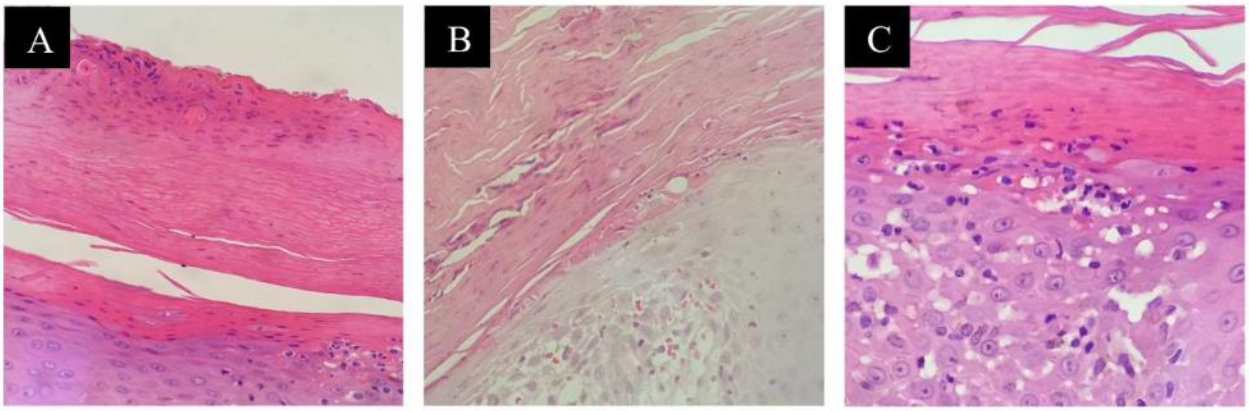
Histopathological parameter	Frequency (n=41)	Percentage (%)
Epidermal Hyperplasia		
Mild	19	46.34%
Moderate	18	43.90%
Marked	4	9.77%
Parakeratosis	41	100%
Munro's microabscesses	19	46.34%
Pustules of Kogo	15	36.59%
Hypogranulosis	15	36.59%
Spongiosis	11	26.83%
Suprapapillary thinning		
Mild	4	9.77%
Moderate	19	46.34%
Marked	18	43.90%
Infiltrates		
Mild	28	68.29%
Moderate	2	4.88%
Marked	11	26.83%
Capillary proliferation		
Mild	12	29.27%
Moderate	9	21.95%
Marked	20	48.78%

Figure 1



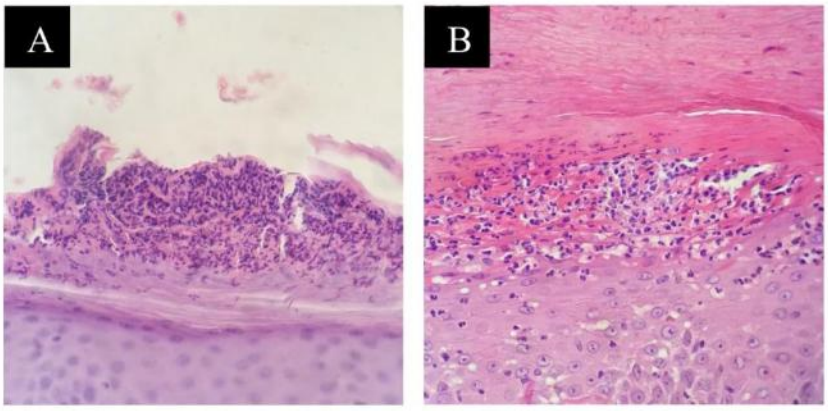
Grades of hyperkeratosis (A) Grade 1 - mild (B) Grade 2 - moderate (C) Grade 3 - marked. (H and E stain, ×40)

Figure 2



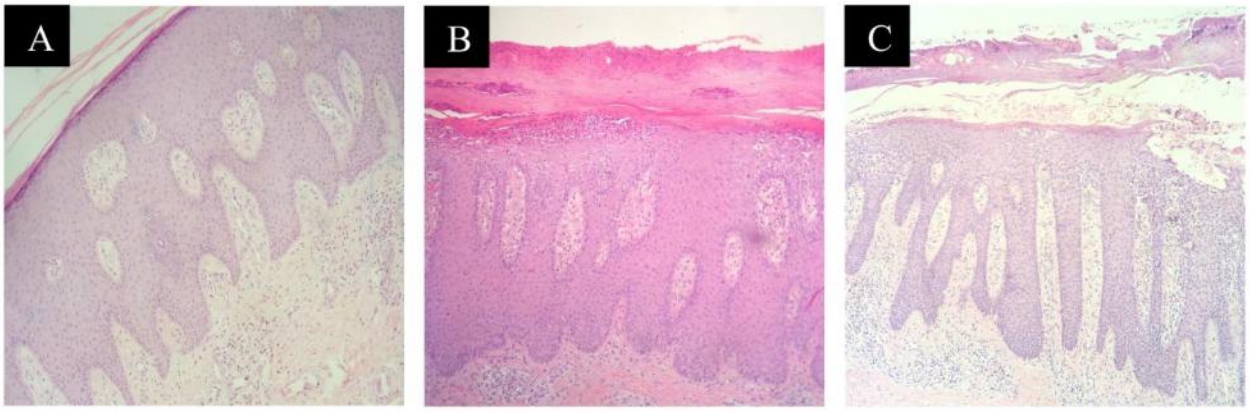
(A) Parakeratosis (B) Hypogranulosis (C) Spongiosis. (H and E stain, ×50)

Figure 3



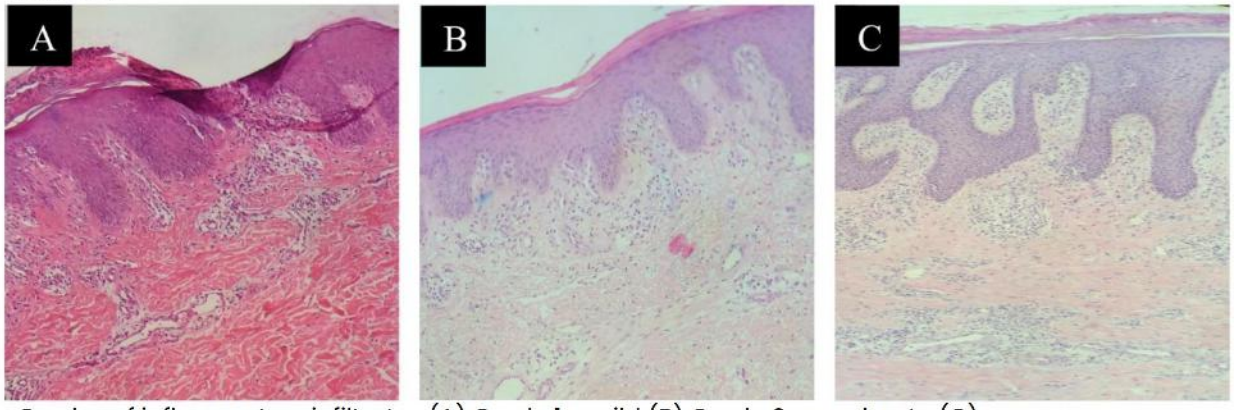
(A) Munro's microabscesses (B) Spongiform pustules of Kogo. (H and E stain, ×50)

Figure 4



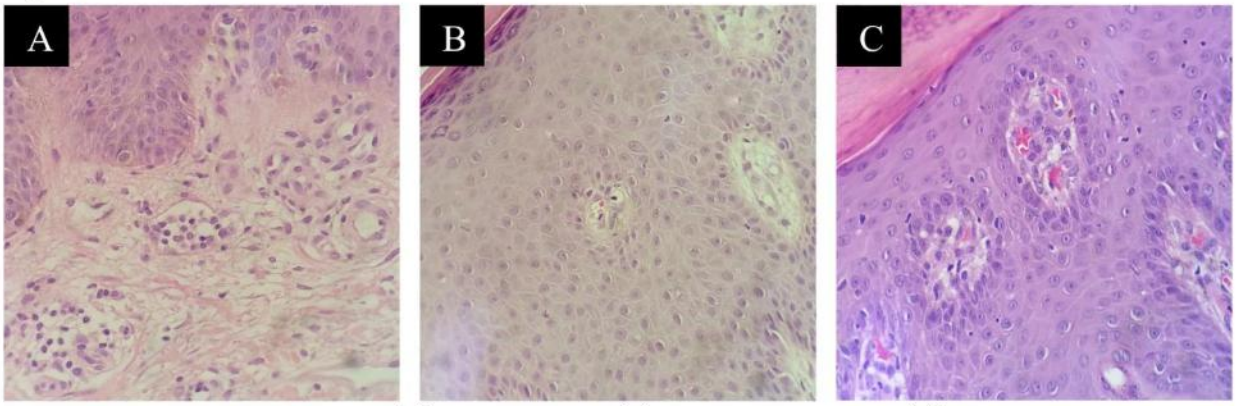
Grades of suprapapillary thinning (A) Grade 1 - mild (B) Grade 2 - moderate (C) Grade 3 - marked. (H and E stain, ×40)

Figure 5



Grades of inflammatory infiltrates (A) Grade 1 - mild (B) Grade 2 - moderate (C) Grade 3 - marked. (H and E stain, ×40)

Figure 6



Grades of capillary proliferation (A) Grade 1 - mild (B) Grade 2 - moderate (C) Grade 3 - marked. (H and E stain, ×50)

DISCUSSION

Psoriasis is the prototype of a psoriasiform pattern in histopathology, which is morphologically defined as epidermal hyperplasia with elongation of the rete ridges, usually in a regular manner ([1]). In the current study, majority of the histopathologic specimens of active psoriatic lesions demonstrated slight epidermal hyperplasia with parakeratosis. Less than half of cases showed Munro's microabscesses, spongiform pustules of Kogo, hypogranulosis, and spongiosis. Moderate suprapapillary thinning, sparse perivascular and interstitial infiltrates of polymorphonuclear lymphocytes, and dilated capillaries in the papillary bodies engorged with erythrocytes and lymphocytes were appreciated as well.

Results showed histopathologic features of both early and fully developed psoriatic lesions lesions. Based on previous literature, a psoriatic lesion in its early stage consists of sparse superficial perivascular infiltrate of mostly lymphocytes (68.29%), dilated tortuous capillaries in the dermal papillae (29.37%), slight epidermal hyperplasia (46.34%), spongiosis (26.83%) in company with a few lymphocytes in discrete foci in the lower part of the epidermis, spongiform and subcorneal pustules within the epidermis (36.59%), hypogranulosis in some foci (36.59%), and mounds of parakeratosis (100%) with neutrophils at their summits staggered within the stratum corneum, sometimes beneath the retained original cornified layer with its basket-woven configuration ([1]).

Fully developed lesions are usually characterized by moderately dense perivascular and interstitial infiltrate of lymphocytes in the upper part of the dermis (26.83%), dilated spiraled capillaries in a thin dermal papillae (48.78%), psoriasiform hyperplasia (9.77%) with rete ridges of equal length, thin suprapapillary plates (43.90%), slight spongiosis (26.83%) in the lower part of the epidermis, and spongioform pustules (36.59%) in the upper reaches of the epidermis. The granular zone of the epidermis is decreased or absent (36.59%), except in association with adnexal structures where it is preserved. Confluent parakeratosis (100%) is also noted within which neutrophils in collections (46.34%) are layered ([1]).

In psoriatic lesions of the later stage, there are sparse superficial perivascular and interstitial infiltrate of lymphocytes (68.29%), subtle fibroplasia in the papillary dermis, dilated tortuous capillaries in dermal papillae (48.78%), psoriasiform hyperplasia of variable extent with rete ridges of equal lengths, slightly thin suprapapillary plates (9.77%), wedge-shaped hypergranulosis, and compact orthokeratosis ([1]).

CONCLUSION

Previous studies have shown that recognized histopathological features of psoriasis are not always found in a well-developed lesion ([5]). The cardinal histopathological features (hyperkeratosis with confluent parakeratosis, Munro microabscesses, spongiform pustules of Kogoj, hypogranulosis with suprapapillary thinning, regular acanthosis, clubbed rete ridges, dilated capillaries, and perivascular lymphocytes) ([10]), may not be present in one section alone.

The disparity between findings of the present study and established histopathological features in an active lesion of psoriasis can be explained by the high possibility that the skin punch biopsies were taken at different stages (early, fully developed, later). Some of the lesions may have also been biopsied when they have been inactive or regions of the lesions from where the biopsies had been taken were inactive.

The above study is a simple one, a straightforward review of the histopathology of psoriasis and its comparison with well-documented parameters of previous literature. Using the visual analogue scale of Moorchung N *et al* (2013) to grade the different histopathologic parameters (epidermal hyperplasia, suprapapillary thining, inflammatory infiltrates, and capillary proliferation), a better understanding of the histopathology of psoriasis was achieved as the differences in grading (mild, moderate, and marked) regarding the same histopathological parameter changed according to the stage of a psoriatic lesion.

RECOMMENDATION

Further research involving other histopathological parameters of psoriatic lesions not included in the study such as edema of the papillary dermis, mitotic figures in keratinocytes, wedge-shaped hypergranulosis, fibroplasia, and orthokeratosis would be able to give a better picture of the histopathology of psoriasis. Also, the parameters that were included the study however graded as present or absent, namely spongiosis, hypogranulosis, parakeratosis, and Munro microabscesses, should be graded from mild to marked as was done to epidermal hyperplasia, suprapapillary thining, inflammatory infiltrates, and capillary proliferation as differences in grading was noted to change according to the stage of a psoriatic lesion.

Future studies can also focus on correlating histopathologic parameters and their occurrence in early, fully developed, and later psoriatic lesions. This would help give a better understanding of histopathological changes during exacerbations and during the remission phase.

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