

Lichen planus pigmentosus and ashy dermatosis: a clinical, dermoscopic and histopathological comparison

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Abstract

Background Lichen planus pigmentosus (LPP) and ashy dermatosis (AD) are disorders of hyperpigmentation and differentiation between two can be difficult. They can be close mimickers. Earlier they were considered the same entity but over time various authors enlisted a few clinical and histopathological differences between the two. In this review, we would add the additional dermoscopic differences and review the clinical and histopathological differences between these two confusing entities.

Aim To differentiate between lichen planus pigmentosus and ashy dermatosis on the basis of clinical, dermoscopic and histopathological features.

Methods We selected ten patients of newly diagnosed lichen planus pigmentosus and ten of ashy dermatosis presenting to dermatology OPD. Clinical examination, dermoscopy and punch biopsy were performed in each case.

Results Out of the 20 patients who were included in this study, 10 were diagnosed with lichen planus pigmentosus and 10 with ashy dermatosis. 80% patients presented with pruritus in LPP and all patients were asymptomatic in AD. In LPP, most common pattern was diffuse where on dermoscopic examination, granules were seen arranged in a hem like pattern. In AD, pigment was seen present in a curvilinear fashion.

Conclusion Differentiation between lichen planus pigmentosus and ashy dermatosis can be a daunting task. Dermoscopy is a useful and non-invasive modality that can be of immense help.

Key words

Ashy dermatosis, lichen planus pigmentosus, dermoscopy.

Introduction

Quest for beauty is there since time immemorial. Therefore, hyperpigmentation of face, other exposed areas and seldom over covered sites is

one of the commonest complaints of Indian patients presenting to a dermatologist. It can be distressful and can have significant psychosocial impact on the patient. Lichen planus pigmentosus and ashy dermatosis are two close mimickers. Differentiation between these two entities is still elusive. Clinical resemblance and histopathological resemblance makes the diagnosis even more difficult. With the advent of dermoscope, it has become easier to differentiate between these two disorders. This study has been carried out to differentiate and

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compare the clinical, histopathologic and dermoscopic features of LPP and AD.

Material and Methods

An observational and comparative study was conducted in the dermatology department of a tertiary care hospital over a period of one year. Our study included female and male patients in the age group 18 to 70 years coming to Dermatology outpatient department with the complaint of diffuse hyperpigmentation. On the basis of clinical examination, patients were divided into 2 groups: lichen planus pigmentosus and ashy dermatosis. Any patient who was on treatment for pigmentation from last 3 months or having any active infection was excluded from the study. After thorough clinical examination, dermoscopy was performed and skin biopsy was done for histopathological examination. Other appropriate investigations including complete blood count, thyroid profile were also performed.

A thorough history was taken in terms of demographic details including age, sex, site and age of onset of hyperpigmentation, duration, rate of progression, any prior drug history, history of exposure to contact allergens and history of systemic diseases. Complete clinical examination was performed. Written consent was taken from all the patients. Photographs were taken for documentation. Dermoscopy was done with Dermlite DL3N dermoscope. Skin biopsy was done using 4mm punch under local anesthesia and specimens were sent for histopathological examination in 10% formalin to note the comparative changes.

Results

The total number of patients included in our study was 20. They were divided into two groups, with ten patients of ashy dermatosis and

ten of lichen planus pigmentosus. The most common complaint in both the groups was cosmetic disfigurement of face and neck mainly due to hyperpigmentation. Commonly affected age group was 26-42 years in both disorders. Out of 20 patients, 17 were females and 3 males. Course of pigmentation varied from 4 months to 6 years.

Out of ten patients of LPP, 8 were females & 2 males (**Figure 1**) and in AD, 9 were females and 1 male (**Figure 2**). On clinical examination and history of LPP, 8 patients had pruritus & photosensitivity. In AD, all the patients were asymptomatic. In LPP patients, most common site of onset was face with temples in 6 patients (60%) and sides of face in 4 (40%). Pigmentation started as brownish black macules which later on became confluent (**Figure 3**). Pigmentation was bilaterally symmetrical in 4 (40%) patients. Most common pattern observed was diffuse (60%) followed by blotchy (20%) and follicular (20%). Pigmentation was irregular with no well defined margins. Other than face, pigmentation was present over neck and upper extremities (photoexposed areas). Overall trunk involvement was less. History of prolonged sun exposure was present in 2 patients. None of the patients had oral mucosal involvement. In patients of AD, site of onset was face in 6 (60%) patients (**Figure 4**), upper extremities in 2 patients (20%) and abdomen in remaining 2 (20%). Pigmentation was blue-grey in 6 (60%) whereas blackish brown in 4 patients (40%). It was bilaterally symmetrical in all 10 patients (100%). Pigmentation was gradually progressing to involve other areas in all patients. None of the patients exhibited erythematous border surrounding the lesion. On dermoscopy of LPP, pigment deposition was heterogenous, at some places it was more and at some less. Whereas in AD pigmented granules were more homogeneously distributed. In LPP multiple

Table 1 Clinical and histopathological comparison between LPP and Ashy Dermatitis

Features	LPP (n=10)	Ashy Dermatitis (n=10)
Sites involved commonly	Face, neck(photoexposed)	Face , arms, trunk
Pruritus	80%	0%
Color of pigmentation	Brown black, dark brown	Blue-brown
Symmetry	40%	100%
Oral Mucosal involvement	nil	nil
Epidermal hyperkeratosis	40%	20%
Epidermal atrophy	60%	80%
Vacuolar degeneration of basal layer	100%	100%

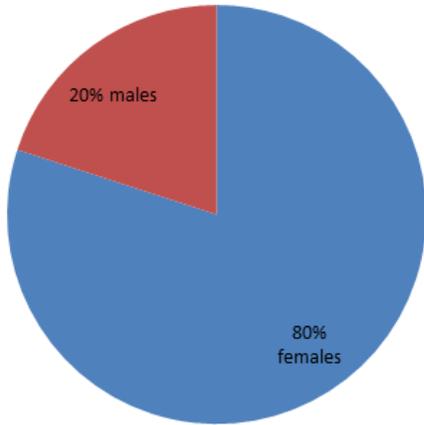


Figure 1 Sex distribution in LPP

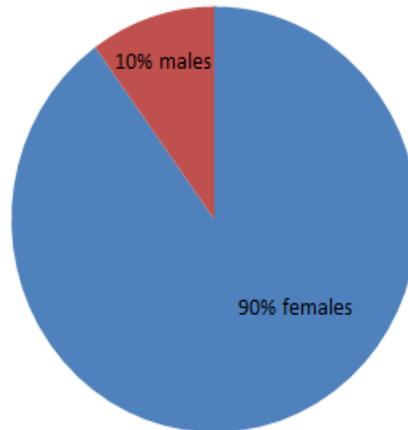


Figure 2 Sex distribution in AD

brownish-black arcuate, semi arcuate and angulated pigmented structures were present more so around the perieccrine area. At some places, pigmentation was seen deposited around the follicular openings also. In AD, blue-black pigmented dots were present alongwith some pale white areas (**Figure 5**). Unlike LPP, pigment was not seen surrounding the follicular openings. Blue black pigmented dots histologically correlated to melanophages present in deeper dermis. Pigment granules were deposited in a ‘Hem like’ pattern (**Figure 6**) in LPP. This pattern was visible in 6 (60%) patients and more appreciable over trunk than face. Pigmentary granules histologically correlated with presence of melanophages in papillary dermis. In AD over face, pigment pattern almost resembled that of LPP but homogeneity helped in differentiating between the two.

Histopathology of LPP revealed focal epidermal hyperkeratosis in 4 (40%) patients (**Figure 7**)

and atrophy in remaining (60%). Basal cell degeneration was present in all cases (100%). Papillary dermis was thickened in all 10 patients (100%) with delicate fibroplasia and mucin deposition in 6 (60%) cases. Pointed rete ridges giving ‘arrow head’ appearance was present in 2 patients (20%) (**Figure 7**). 6 patients had lympho-histiocytic perivascular infiltrate along with numerous melanophages. Numerous foci of colloid bodies were present in 4 patients at dermoepidermal junction and papillary dermis. 2 of the biopsies had band like infiltrate along dermoepidermal junction. On histopathology of AD, focal hyperkeratosis was present in 2 patients (20%) and flattening of epidermis in remaining 8 (80%) patients. In basal layer, focal liquefactive degeneration was present in all cases (100%). Perivascular lymphocytic infiltrate was seen in 5 cases. Few colloid bodies were present at dermoepidermal junction in 1 patient. In all cases (100%), melanophages were seen present in deeper dermis (**Figure 8**).



Figure 3 showing brown-black hyperpigmentation over photoexposed sites (face and neck) in LPP



Figure 4 Clinical picture of Ashy Dermatitis showing hyperpigmentation over face

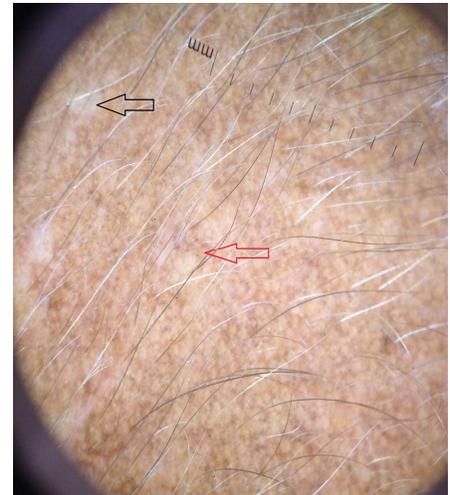


Figure 5 Dermoscopic picture of Ashy Dermatitis showing pale white areas (black arrow) interspersed with hyperpigmentation (red arrow).

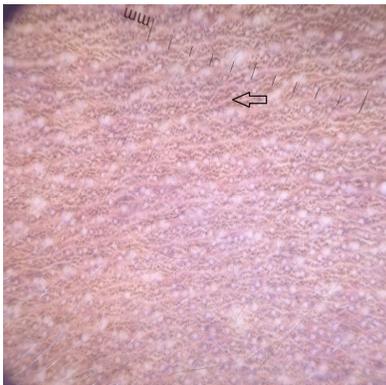


Figure 6 Dermoscopic picture of LPP showing Hem like pattern (black arrow).

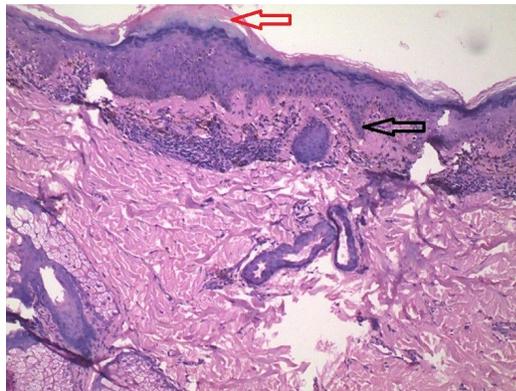


Figure 7 Histopathology of LPP showing hyperkeratosis (red arrow) and arrow head appearance of rete ridges (black arrow). Presence of melanophages in dermis along with band like and perivascular infiltrate can also be appreciated. (H & E, 100X)

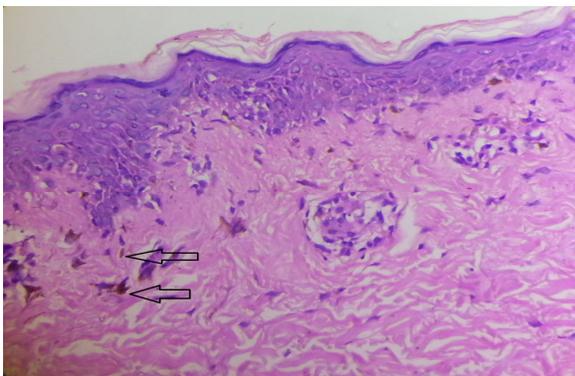


Figure 8 Histopathology of Ashy Dermatitis showing presence of melanophages in deeper dermis (black arrows) and perivascular infiltrate. (H & E, 400X)

Discussion

Lichen planus pigmentosus (LPP) is a common pigmentary disorder seen among Asian population. It is fairly common in Indian population. This term was coined by Bhutani et al.¹ Ashy dermatosis (AD), also known as erythema dyschromicum perstans (EDP) and erythema chronicum figuratum melanodermicum² was first described by Ramirez.³ Some authors consider AD and erythema dyschromicum perstans as different entities whereas others consider it to be a same

entity. LPP starts in third to fourth decade of life. Vega et al⁴ reported female preponderance whereas Bhutani et al¹ observed no difference in sex distribution. A host of factors have been implicated in LPP including but not limited to cosmetics, fragrances, hair dyes and mustard oil application.¹ Association with hepatitis C virus has also been postulated.⁵ Etiological factors implicated in AD include HLA association^{6,7}, certain drugs like omeprazole, ammonium nitrate, benzodiazepines, toxic substances like pesticides, cobalt allergy, and exposure of chlorothalonil.⁸⁻¹³ LPP is characterized by coalescing gray-blue patches on the exposed areas, especially face and neck. As per literature, LPP is a variant of lichen planus but unlike classical lichen planus, mucous membrane involvement is rare.¹⁴ Photosensitivity and pruritus is reported by some patients. Onset of AD can be gradual or at times it can present abruptly. It is usually asymptomatic and is clinically seen as ashy gray colored macules coalescing to form diffuse patches of hyperpigmentation. The disease starts from unexposed areas, commonest site being trunk, subsequently it can involve face and extremities. This is in contrast to LPP, where lesions appear first on photoexposed sites.⁴ The characteristic elevated erythematous active border described in patients of AD is hardly appreciable in Indian patients. In a study done by Kanwar et al.¹⁵ in LPP patients, the commonest pattern of hyperpigmentation was diffuse and on histopathology, basal cell degeneration was seen in 78.5% of patients, dermal melanophages were present in 63%, and perivascular infiltrate in 81.5%. Band-like lichenoid infiltrate which is considered an important feature of lichenoid disorders was observed in only 18.5% of the cases.¹⁵ In our study, basal layer degeneration was seen in 100% cases with perivascular infiltrate and melanophages in 60%. As per literature, dermoscopic examination of LPP reveals the non uniform accentuation of normal

reticular pattern and hem like pattern which can be appreciated mostly over extremities.¹⁶ Findings in present study were in support of this data. Hence LPP is a distinct clinical entity with characteristic clinical, histopathological and dermoscopic features.

Dermoscopic findings of AD show the accentuation of normal reticular pattern of face. Pigmented lines forming this reticular pattern are more thickened than usual and are granular rather than linear. Reticular pattern can be complete at some places whereas at other places it disintegrates into more discrete, granular, linear bluish gray spots. Over extremities, blunting of pigment surrounding the acrosyringial openings is seen.¹⁶ Histopathology of ashy dermatosis is not very characteristic of the disease. Active lesions may show vacuolar degeneration of the stratum basale with pigmentary incontinence and melanophages in the upper dermis. In the late stages, pigment incontinence is a predominant feature with sparse infiltrate.¹⁷ In AD, Vega et al. reported hyperkeratosis in 80%, epidermal thinning in 65%, basal layer vacuolization in 85%, perivascular infiltrate in 95% and dermal melanophages in 100% cases.⁴ In current study, epidermal hyperkeratosis was observed in fewer cases (20%) whereas thinning was seen in 80% cases. Presence of dermal melanophages in all cases was consistent with results of above mentioned study.

Till date, use of dermoscope was limited to melanoma and other related malignant conditions only. There is paucity of data regarding its use in other dermatosis like pigmentary disorders. AD lack distinct histopathological features which leads to its confusion with LPP. Lichenoid infiltrate which is usually seen in LPP, can sometimes be also seen in Ashy dermatosis due to chronic damage to basal layer.^{18,19} Combining dermoscopy and

histopathology tools together, differentiating between two entities can be made easier. Both the conditions follow chronic course with persistence of pigmentation for months to years. Lack of adequate treatment options has increased psychosocial distress related to these diseases.

Conclusion

Over the past years, various studies have been done to prove that AD and LPP are two different entities. Differentiation between two can be a daunting task. Till date, histopathology was the only confirmatory tool to differentiate between two. In our study, we have emphasized on the characteristic dermoscopic findings which can lead us to the final diagnosis. In most of the cases demoscropy can help us in confirming the disease without performing biopsy especially over face. During follow up period, regular dermoscopic examination helps in assessing the response to treatment. Hence, dermoscopy is a non invasive tool which obviates the need of biopsy and helps in monitoring the therapeutic response and prognosis.

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