

Dermoscopic Characteristics of Melasma in Indians: A Cross-sectional Study

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ABSTRACT

Introduction: The aim of this study was to assess the various dermoscopic features of melasma in Indian population.

Materials and methods: A total of 100 cases of clinically diagnosed melasma and 50 controls without melasma or any other facial pigmentation were studied dermoscopically at a tertiary care center in Eastern India. The various described relevant patterns of pigmentation on dermoscopy were recorded. Similar patterns were also looked for in the control population and the two compared. Statistical analysis was done with Fisher's exact test and a p-value of <0.05 was considered statistically significant.

Results: Cases consisted of 75 females and 25 males with an average age of 36 years as against an average age of 35 years for controls. Of the various patterns of pigmentation, reticuloglobular pigmentation was statistically significant in association with melasma ($p < 0.0001$). The unpatterned patchy brown black pigment was also significantly associated with melasma as compared to controls ($p = 0.0346$). A granular pigmentary pattern was also shown to be significantly associated with a diagnosis of melasma ($p = 0.0123$). Telangiectasia was seen more frequently in patients as compared to controls ($p = 0.0327$). Perifollicular brown black globules were not significantly correlated with a diagnosis of melasma. More than one pattern was present in a number of patients.

Conclusion: Dermoscopy of melasma can be used for diagnosis, prognosis, and response or adverse effect of therapy.

Study limitations: Lack of direct correlation with histopathology and inclusion of therapy naïve as well as patients on therapy were major limitations of this study.

Keywords: Dermoscopy, India, Melasma.

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INTRODUCTION

Melasma is an acquired hypermelanosis of uncertain etiology that occurs exclusively in sun-exposed area,

mostly on face and rarely on neck and forearms.¹ It is more common in women and in Asians. Exact pathogenesis remains elusive, however, genetic predisposition and ultraviolet light exposure seem to play an important role.²

Diagnosis of melasma remains clinical and aided by Wood's lamp examination; the latter has also been questioned in the recent past.³ Melasma needs to be differentiated from other causes of facial hypermelanoses, such as pigmented contact dermatitis, lichen planus pigmentosus, and erythema dyschromicum perstans. Histopathology is not performed routinely for diagnosis of facial hypermelanoses because of reluctance on part of the patient and physician alike as there is a risk of development of unsightly scar/postinflammatory dyschromia.

Dermoscopy is increasingly being used for diagnosis of pigmentary disorders other than malignancy.⁴ There are only a few studies till date on dermoscopic patterns in melasma in Indian patients. The aim of the study is to characterize dermoscopic pattern of melasma, so as to allow early diagnosis of melasma and differentiate it from other facial hypermelanoses.

MATERIALS AND METHODS

Sample and Procedure

A total of 100 patients with clinical diagnosis of melasma and 50 age and sex matched controls were included in the study. Patients who had mixed pattern of pigmentation, such as melasma with pigmentary demarcation line, pigmented contact dermatitis, photomelanoses or cases where clinical diagnosis of melasma was doubtful were not included in the study. Since most of the melasma patients in our country apply some form of topical medicine before reporting to physicians, patients were recruited irrespective of the treatment undertaken. Patients were recruited from outpatient department (OPD) of a tertiary care center of Eastern India. Controls consisted of patients who reported to OPD for unrelated illness and did not have any facial pigmentation on clinical examination. Duration of study lasted from September 2014 to September 2015. The study was approved by institutional ethical committee. All participants signed informed consent for photography and inclusion in the study.

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Patients' particulars, history, and clinical examination were recorded in a printed pro forma and digital photographs were taken.

Dermoscopic Examination

Dermoscopy was performed using Heine Delta 20 Plus in polarized mode and images were captured using Nikon D5200 in manual mode (shutter speed – 1/4 seconds). As the brightness of light source of the dermoscope reduces after usage, for the study purpose, it was made sure that dermoscope is fully charged. Four images were captured from affected area. Images were analyzed independently by two dermatologists. After analysis of all the images, interpretation of dermoscopic pattern was made and recorded. Interpretation of dermoscopy was based on pattern described in literature. Presence of reticuloglobular pattern, perifollicular brown black globules, telangiectasia, granules or unpatterned patchy brown black pigment was recorded. Similar patterns were also looked for in control population.

Statistical Analysis

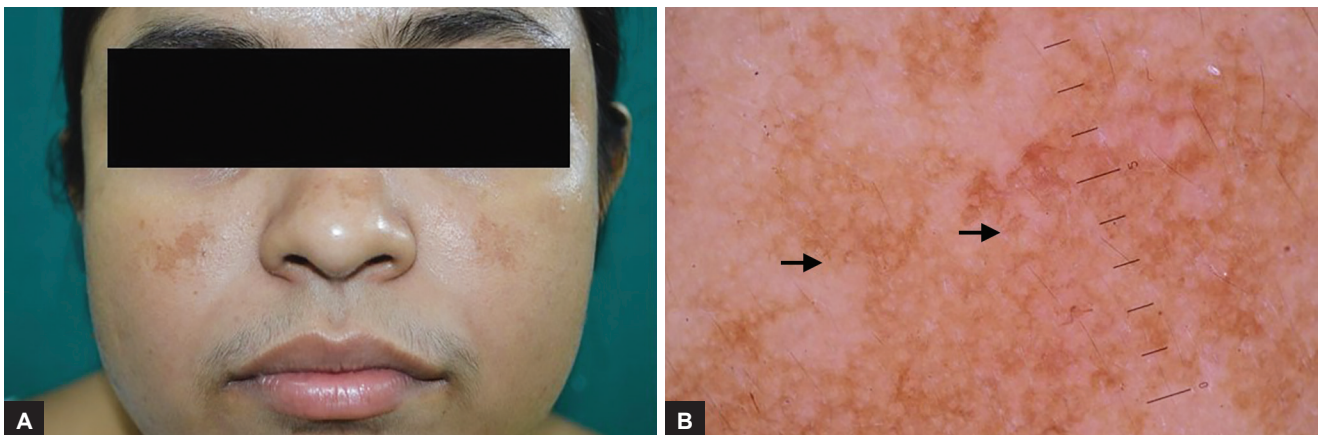
The data generated were used to create a 2×2 contingency table and p value was calculated by the Fisher's

exact test. Statistical analysis system software package for Windows® version 9.2 was used for statistical analysis and $p < 0.05$ were considered statistically significant.

RESULTS

A total of 100 patients with melasma and 50 controls were studied. Patients consisted of 75 females and 25 males and age ranging from 27 to 48 years. Average age of patients were 36.03 years. Controls consisted of 36 females and 14 males and age ranging from 20 to 51 years. Their average age was 35.14 years.

Reticuloglobular pigment was seen in 83% of melasma cases compared with 20% controls (Figs 1A and B). Presence of reticuloglobular pigment shows statistically significant association with melasma ($p < 0.0001$). Unpatterned patchy brown black pigment was seen in 17% of cases as compared to 4% controls (Figs 2A and B). It was also shown to have statistical significance for diagnosis of melasma ($p = 0.0346$). Granular pigment was seen in 28% of cases as compared to 10% controls and was shown to have statistically significantly association with clinical diagnosis of melasma ($p = 0.0123$) (Figs 3A and B). Telangiectasia was seen more frequently in patients as compared to controls ($p = 0.0327$) (Figs 4A and B). Perifollicular brown black



Figs 1A and B: Clinical image of melasma and corresponding dermoscopy with reticuloglobular pigment pattern on dermoscopy



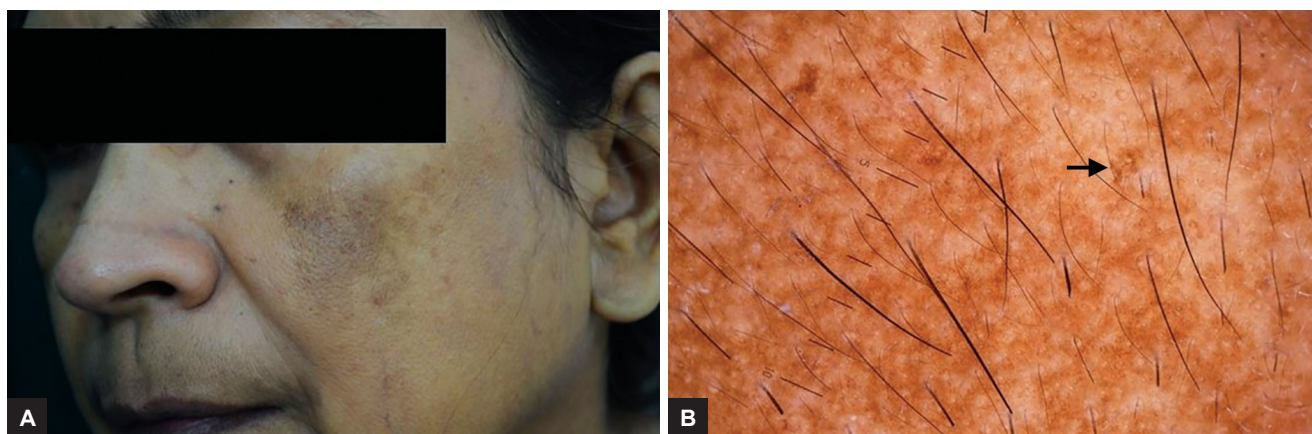
Figs 2A and B: Clinical image of melasma and unpatterned pigment in dermoscopy of melasma



Figs 3A and B: Clinical image of melasma and granules or dots on dermoscopy



Figs 4A and B: Clinical image of melasma and telangiectasia



Figs 5A and B: Clinical image of melasma and perifollicular brown black pigment

globules were seen in 60% of patients as compared to 62% of controls (Figs 5A and B). There was no statistically significant association between perifollicular brown black globules and diagnosis of melasma ($p = 0.8606$) (Table 1).

DISCUSSION

Dermoscope is traditionally being used for diagnosis of malignant disorders particularly for screening of nevi

and early diagnosis of melanoma. It is now being increasingly used for diagnosis of various inflammatory and infectious disorders. It is also being used for diagnosis of pigmentary disorders.

Dermoscopy of normal facial skin shows opening of sweat glands and hair follicles on the background of diffuse pigmentation creating a pseudonetwork pattern. Melanin is the main chromophore in pigmented skin lesions and anatomical location of melanin determines

Table 1: Dermoscopic patterns observed in melasma

| Pattern | Cases | Control | p-value |
|--|--------------|-------------|---------|
| Reticuloglobular pigment | 83/100 (83%) | 10/50 (20%) | <0.0001 |
| Perifollicular brown black globules | 60/100 (60%) | 31/50 (62%) | 0.8606 |
| Telangiectasia | 33/100 (33%) | 8/50 (16%) | 0.0327 |
| Granular | 28/100 (28%) | 5/50 (10%) | 0.0123 |
| Unpatterned patchy brown black pigment | 17/100 (17%) | 2/50 (4%) | 0.0346 |

color perceived on dermoscopy. Melanin present in stratum corneum appears as black, dermoepidermal junction appears as brown, and dermis appears as blue to gray.⁵ Dermoscopy of pigmented lesions of face can be used for diagnosis and prognosis of the clinical condition. Color of the pigment on dermoscopy can determine the depth of pigment and has obvious therapeutic implications as dermal pigment is difficult to be treated by conventional therapy. Dermoscopic pattern in melasma has been described as reticuloglobular pattern, perifollicular brown black globules, and arcuate and honeycomb like pattern.⁶ LI et al have described dermoscopic features of melasma in Chinese patients. They have described presence of light yellow uniform brown patches and dark brown patches as features of melasma.⁷ In another study by Carla Tamler et al, authors have classified melasma based on dermoscopy and correlated it with classification of melasma by Wood's lamp examination. They considered brownish pigment with regular pigmented network as epidermal, bluish gray pigment as dermal, and mixed type with both the features. However, histopathologic correlation in this study is also lacking.⁸ Dermoscopy criteria for diagnosis of exogenous ochronosis in patients undergoing therapy for melasma has been discussed by Khunger et al and Mishra et al.^{9,10} Other skin lesions, such as seborrheic keratosis and solar lentigenes can also be differentiated with the help of dermoscope.¹¹

In our study, we found that reticuloglobular pattern on dermoscopy is most characteristic finding for diagnosis of melasma and was seen in 83% of patients with melasma. Around 70% of patients had no pattern and was described as unpatterned patchy brown black pigment. This unpatterned pigmentation has not been described earlier and we hypothesize that in many patients of melasma, especially those having mixed pattern of melasma have superimposed pigment on a reticuloglobular network, it results in unpatterned pigment on dermoscopy.

Granular pigment or dots are seen in 28% of patients. These dots represent melanophages present in the dermis as a consequence of the dermal incarceration of pendulous melanocytes and represent cases of mixed or dermal melasma.¹² This finding has therapeutic implications as mixed and dermal melasma are difficult to treat. Achar et al in an epidemiologic study of melasma classified 54.48%

cases as dermal and 24.03% cases as mixed melasma by Wood's lamp examination, which is at variance with our findings. However, histopathology will be required to exactly classify the type of melasma and dermoscopy remains an indicator till larger studies with dermoscopy and histopathological correlation are conducted.

Telangiectasia were seen in a significantly greater number of patients with melasma compared to controls. It is not a characteristic finding of melasma but detection of telangiectasia on dermoscopy has therapeutic implication as it suggests steroid abuse or concomitant erythematotelangiectatic rosacea.¹³ Vascular component in pathogenesis of melasma has been recently described. Findings of telangiectasia which were seen more commonly in patients as compared to controls may be attributed to this finding or because of previous treatment with topical steroids.¹⁴ However, capillary network in dermoscopy was found to be statistically insignificant in a study by LI Yun et al in Chinese patients with melasma.⁷ It is important to perform dermoscopy in all patients of melasma, because many a times patients do not reveal the complete history and one can rapidly screen patients in whom triple combination needs to be avoided.

Perifollicular brown black globules have been described as dermoscopic feature of melasma, however, we found an almost equal frequency in controls and is not a characteristic dermoscopic feature of melasma.

CONCLUSION

Dermoscopy is an important tool for diagnosis of melasma. Diagnosis can be made based on pattern recognition. Pattern of pigmentation can also indicate depth of pigment and has obvious therapeutic implications. Adverse effects of therapy, such as steroid-induced skin damage and exogenous ochronosis can also be detected with the help of dermoscope and it can serve as a guide to therapy.

STUDY LIMITATIONS

The study had several limitations. A smaller number of patients in subgroups, lack of direct correlation with histopathology and inclusion of therapy naïve as well as patients on therapy were major limitations of this study.

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