ISSN: 2581 – 3633
PubMed - National Library of Medicine - ID: 101745081

International Journal of Medical Science and Advanced Clinical Research (IJMACR)

Available Online at:www.ijmacr.com

Volume – 6, Issue – 2, March - 2023, Page No. : 60 - 67

A cross-sectional study of clinico-epidemiological and dermoscopic features in the patients with melasma

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How to citation this article: Vandana Yadav,Mohammad Hamza Ansari, Atul Mohan, Satyendra Kumar Singh, Aanchal Agarwal, Chandra Pratap Singh, "A cross-sectional study of clinico-epidemiological and dermoscopic features in the patients with melasma", IJMACR- March - 2023, Volume – 6, Issue - 2, P. No. 60 – 67.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Melasma is an acquiredhyper-pigmentary disorder, characterized by brownish patches over sun-exposed areas of skin, which is often difficult to treat. Dermoscopy has become an essential tool by which we can diagnose melasma and follow the patient to see the treatment response.

Aims and Objectives: To study the clinical and epidemiological findings associated with melasma and to evaluate the frequency of dermoscopic findings in patients with melasma.

Materials and Methods:A total of 61 consecutive patients attending the outpatient department of dermatology were included in the study. After obtaining the consent, history taking and clinical examination were performed. Woods lamp and dermoscopic findings were noted.

Results: Out of 61 patients, who enrolled in this study, 53 (86.9%) were females and 8 (13.1%) were males. The mean age of onset of melasma was 31.5 years and the average duration of illness was 4.9 years.Malar pattern in 32 (52.5%) patients, centrofacial in 29 (47.5%) patients, and mandibular pattern in none of the patient was observed. A history of hypothyroidism was present in 12 (19.7%) patients.Onset in pregnancy was observed in 25(47.2%) female patients. On dermoscopic evaluation, diffuse dark brown pseudo-network in 32 (52.4%), diffuse light brown pseudo-network in 48 (78.7%), brown dots, granules & globulesin 52 (85.2%), arcuate annular structure in 44 (72.1%) of the patients were noted.

Conclusions: In melasma, female gender, hypothyroidism and sun-exposure are some factors which play a role in its pathogenesis and frequency of dermoscopic patterns may be helpful in diagnosis and to differentiate it from other facial hypermelanoses.

Keywords: Clinicoepidemiological, Dermoscopy, Melasma

Introduction

Melasma is a chronic, recurrent, acquired hyperpigmentary disorder characterized by brownish patches that occur insun-exposed areas, mostly on the face and rarely on the neck and forearms. When melasma is associated with pregnancy it is called chloasma. It is a common pigment disorder among Indian.[1,2] It is of major cosmetic concern to the patient because the main area of involvement is the face. Women are more commonly affected. It affects all races, but there is a particular prominence among Asians.[3]The exact pathogenesis of melasma remains elusive, however, ultraviolet light exposure, genetic predisposition, and female hormonal activity play a major role in its etiopathogenesis. Pregnancy, oral contraceptives, thyroid dysfunction, and anti-seizure drugs are some other factors in the pathogenesis of melasma.[4]Exacerbation of melasma is seen after sun exposure and conversely, melasma gradually fades during sun avoidance. Pigmented contact dermatitis, lichen planus pigmentosus, and some other causes of facial hypermelanoses need to be differentiated from melasma. Diagnosis of melasma remains clinical and aided by Wood's lamp examination and dermoscopy. The use of dermoscopy for the diagnosis of pigmentary disorders other than malignancy is now increasing. Dermoscopic pattern of melasma allows us to differentiate it from other facial hypermelanoses. There are only a few studies till date on dermoscopic patterns of melasma in Indian patients. This study is aimed at studying the clinical and epidemiological findings associated with melasma and evaluating the frequency of dermoscopic findings in patients with melasma.

Material and methods

A total of 61 consecutive patients with a clinical diagnosis of melasma attending the outpatient department of dermatology were included in the study. The patient's particulars, history and clinical examination were recorded in a proforma, and photographs were taken.

All participants signed informed consent for inclusion in the study. Age group, gender, age of onset of melasma, duration of illness, Fitzpatrick skin type, family history, diabetes mellitus, thyroid dysfunction, oral contraceptives intake, onset in pregnancy, occupation (housewife or other), duration of sunlight exposure per day, sunscreen use, cosmetic use, and topical steroid use were noted.

Clinical evaluation was done and depending upon the distributions of lesions, they were divided into centrofacial, malar, and mandibular types. Extra facial findings were also noted. Wood's lamp examination was done to determine the histological pattern like dermal, epidermal, or mixed type.

Dermoscopy was performed using Dermlite DL4 in polarized mode and images were captured using a smartphone camera. After analysis of all the images, the interpretation of the dermoscopic pattern was made and recorded. The presence of diffuse dark brown pseudo-net, diffuse light brown pseudo-net, brown dots, granules and globules, arcuate annular structure, increased vascularity, telangiectasia, and sparing of perifollicular and sweat gland openings were recorded.

Results

Out of 61 patients, who enrolled in this study, 53 (86.9%) were females and 8 (13.1%) were males. Age distribution ranges from 20years to 65 years and the more common age group was 31-40 years. The mean age of onset of melasma was 31.5 years and the average duration of illness was 4.9 years. Summary of the demographic features of study population are given in [Table 1]. Malar pattern in 32 (52.5%) patients, centrofacial in 29 (47.5%) patients, and mandibular pattern in none of the patient was observed [Figure-1 & 2]. Extra facial sites were involved in 2 patients of which one over the forearm and one over the neck. Family history in 14 (23%) patients was elicited. Fitzpatrick skin type IV in 28 (45.9%) patients, type V in 24 (39.3%) patients, and type III in 6 (9.8%) of patients. Out of 53 female patients, 40 (75.4%) were housewives. Hypothyroidism and diabetes mellitus was present in 12 (19.7%) patients and 2 (3.3%) patients respectively.

Onset in pregnancy was observed in 25 (47.2%) female patients. Oral contraceptive pill intake was present in 4 (7.5%) female patients. Duration of Sun exposure of <1 hour/day in 29 (47.5%) patients, 1-4 hours/day in 27 (44.3%) patients, and >4 hours/day in 5 (8.2%) patients. History of aggravation of melasma on sun exposure in 50 (82%) patients. History of sunscreen use in 21 (34.4%) patients, topical steroids in 32 (52.5%) patients, and cosmetics in 36 (59%) patients were present.

On Wood's lamp examination, the epidermal pattern was in 22 (36.1%), dermal in 16 (26.2%), and mixed pattern in 23 (37.7%) patients [Figure-3&4]. On dermoscopic evaluation, diffuse dark brown pseudo-network in 32 (52.4%), diffuse light brown pseudo-network in 48 (78.7%), brown dots, granules & globules in 52 (85.2%), arcuate annular structure in 44 (72.1%), sparing of perifollicular & sweat gland opening in 61, increased vascularity in 38 (62.3%) and telangiectasia in 26 (42.6%) of the patients were noted [Figure5,6 & 7].

Discussion

Melasma is classified into three clinical patterns according to the distribution of the lesions.[5] The centrofacial pattern involves the forehead, cheeks, upper lip, nose, and chin, malar pattern involves cheeks and nose, mandibular pattern involves the ramus of mandible.

Melasma can also be classified into four histological patterns depending upon the depth of pigment deposition.[6] The epidermal type in which pigmentation is intensified under Wood's light, dermal type in which pigmentation is not identified, mixed type in which the pigmentation becomes more apparent in some areas, while in others there is no change and indeterminate type in which the pigment is apparent in the Wood's light, in individuals with skin type VI. The use of dermoscopy

for the diagnosis of pigmentary disorders other than malignancy is now increasing.[7]

Melasma is more common in women. We found about 13.1% involvement of men in our study compared to 10% in a different study.[8]The mean age of melasma patients was 36.3 years in our study as compared to 42.3 years in a different study.[9]This study showed that the mean age of onset of melasma was 31.5 years and the average duration of illness was 4.9 years, similar to a study, which noticed the mean age of onset was 29.9 years and the average duration of illness was 3.5 years.[10]

Among the three clinical patterns of melasma, the malar pattern (52.5%) was the most common in our study, like other studies from India.[11]A positive family history was observed, 23%, in the present study, which was in correlation with an earlier reported study, in which it was 33%.[10]

A total of 19.7% of patients had a history of hypothyroidism in our study as compared to 7.5% in a multicentric cross-sectional study from India.[12]Some of the studies have shown association between melasma and thyroid disorders, especially hypothyroidism but the exact mechanism is not clear.A study conducted in Iran with 45 women with melasma and their controls evaluated the serum levels of anti-thyroid peroxidase antibodies (anti-TPO), T3, T4 and TSH, and showed no difference among the groups but the frequency of thyroid disorders in melasma patients was 37.8% versus 11.1% in the control group.[13]

Pregnancy has been reported to be a triggering factors for melasma in previous studies.[14] In this study, a significant proportion of the study population reported the onset of melasma during pregnancy. A very less number of female patients had a history of taking oral contraceptive pills (7.5%) when compared to other studies, which could be due to the sociocultural factors.

Sunlight exposure is an important triggering factor for melasma because UV radiation directly induces the increase of melanogenic activity, causing the development of epidermal pigmentation.[15] The use of high-protection-factor sunscreen reduces the intensity of the disease by 50% and decreases its incidence during pregnancy by more than 90%.[16]Sun exposure is an important triggering and aggravating factor in most studies and our study, 82% of the patient gave a history of aggravation of melasma after sun exposure. It was found that 34.4% of the study subjects were using sunscreens regularly, which is similar to the figure reported by Krupashankar et al (35%).[17]

On Wood's light examination, we found that the epidermal and mixed patterns weremore common, in contrast to an earlier study, which suggested that the dermal pattern was the most common.[10]Normal facial skin on dermoscopy shows the opening of sweat glands and hair follicles on the background of diffuse pigmentation creating a pseudo-network pattern. The color of the pigment on dermoscopy can determine the depth of pigment and has obvious therapeutic implications as the dermal pigment is difficult to treat. The dermoscopic pattern in melasma has been described as brown dots, granules & globules, diffuse dark brown pseudo net, diffuse light brown pseudo net, arcuate annular structure, sparing of perifollicular and sweat gland openings, increased vascularity, and telangiectasia.[18]

In our study, we found that diffuse dark and light brown pseudo-network and brown dots, granules & globules were the most characteristic findings on dermoscopy for diagnosis of melasma and were seen in 52%, 78%, and

85% of patients with melasma respectively. Similar dermoscopic findings were observed in another study with the reticulonodular pattern as the most characteristic finding for the diagnosis of melasma, seen in 83% of patients, and granular pigment or dots are seen in 28% of patients. [19] 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.[20]

Sparing of perifollicular & sweat gland opening in all 61 patients included in this study was the most common dermoscopy finding which may help to differentiate melasma from exogenous ochronosis. Arcuate annular brown structures were seen in 44 (72.1%) patients.

Increased vascularity was seen in 38 patients (62.3%) and telangiectasia was found in 26 patients (42.6%). Similar findings were present in a study by LI Yun et al in Chinese patients with melasma with the presence of a capillary network in 60% of patients.[21]Detection of telangiectasia on dermoscopy has therapeutic implications as it suggests steroid abuse or concomitant erythema-telangiectatic rosacea and can also guide to decide on the therapy.

Table 1: Summary of the demographic features of study population (n=61)

Mean age	36.3 years
Gender (M: F)	1: 6.7
Mean age of onset	31.5 years
Mean duration of illness	4.9 years
Family history	23 %
Hypothyroidism	19.7 %
Relation with sun-exposure	82 %

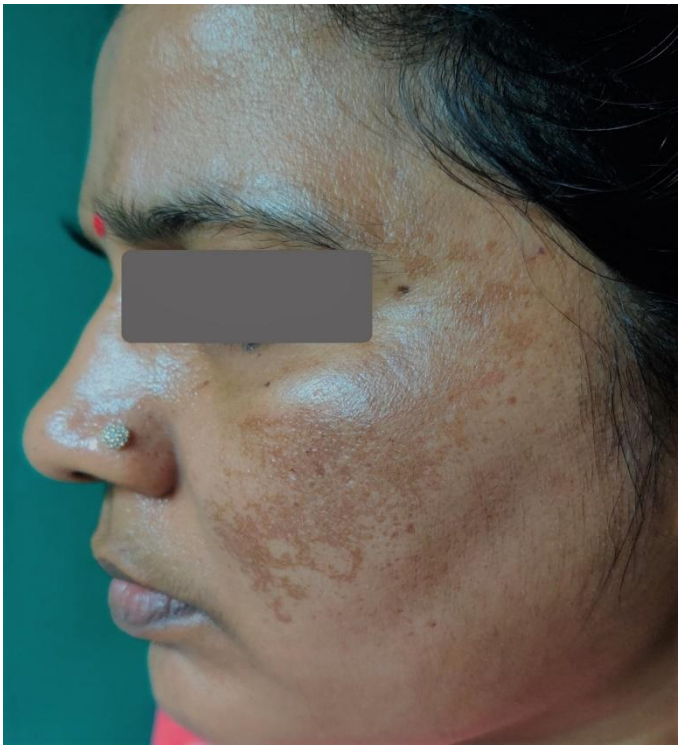

Figure 1: Malar pattern of melasma

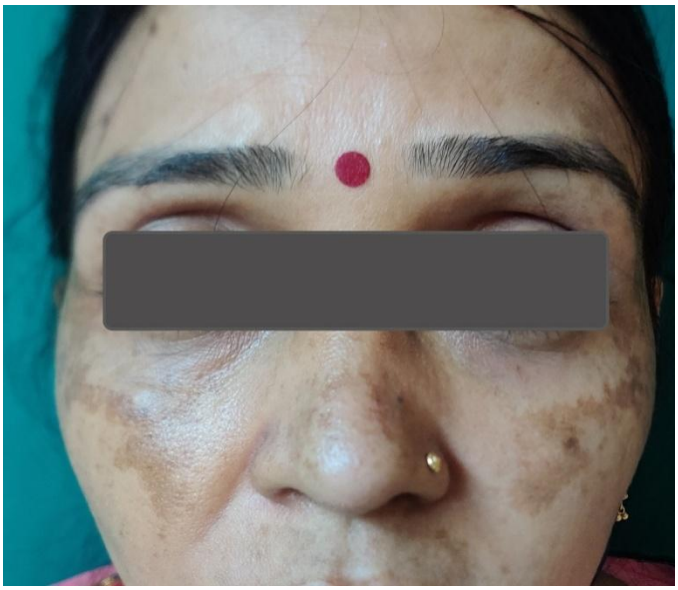

Figure 2: Centrofacial pattern of melasma

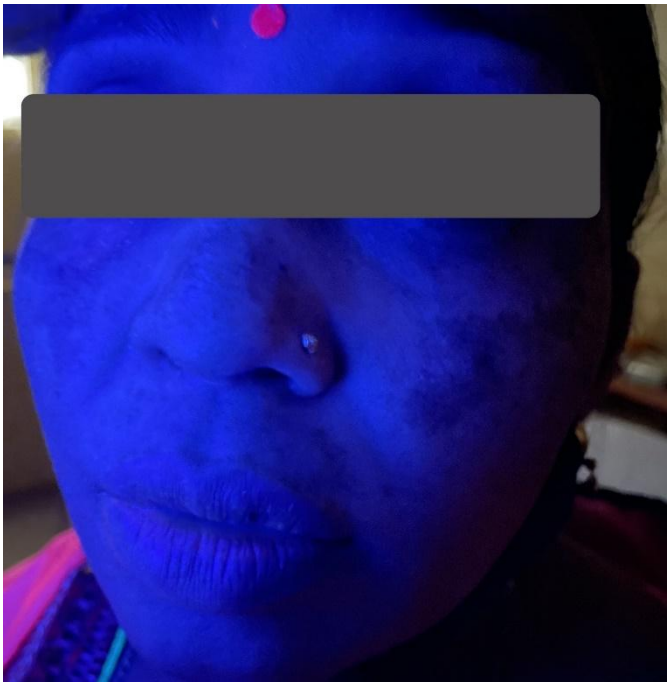

Figure 3: Wood's lamp finding of epidermal melasma (accentuation of pigment)

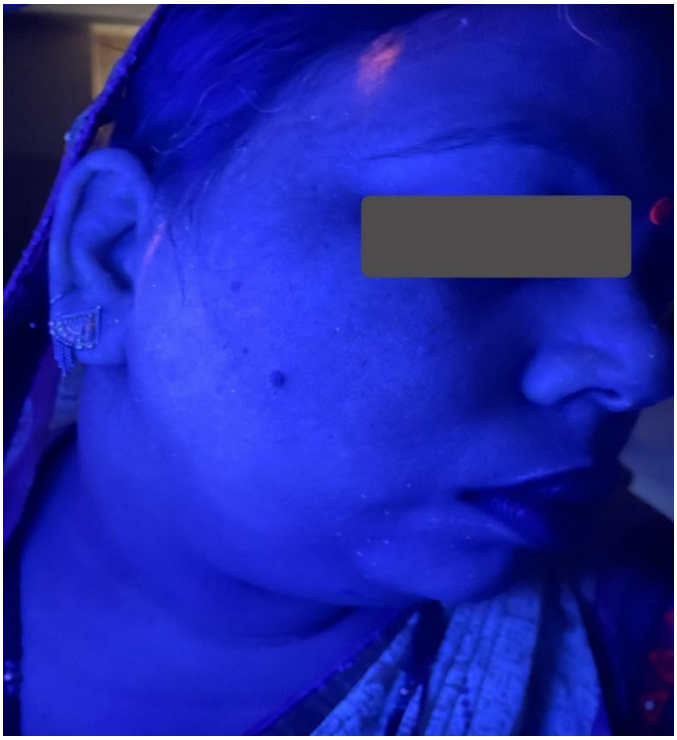

Figure 4: Wood's lamp finding of dermal melasma (no accentuation of pigment)

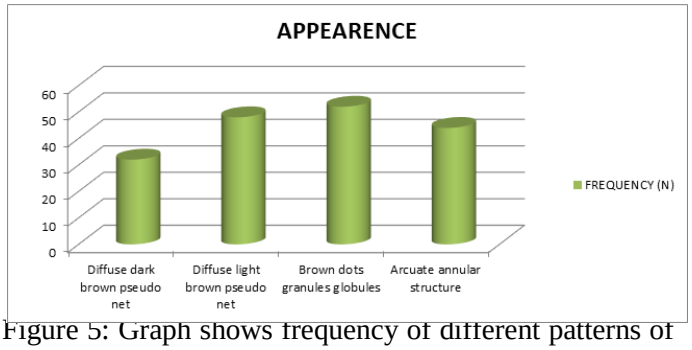

Figure 5: Graph shows frequency of different patterns of melasma on dermoscopy

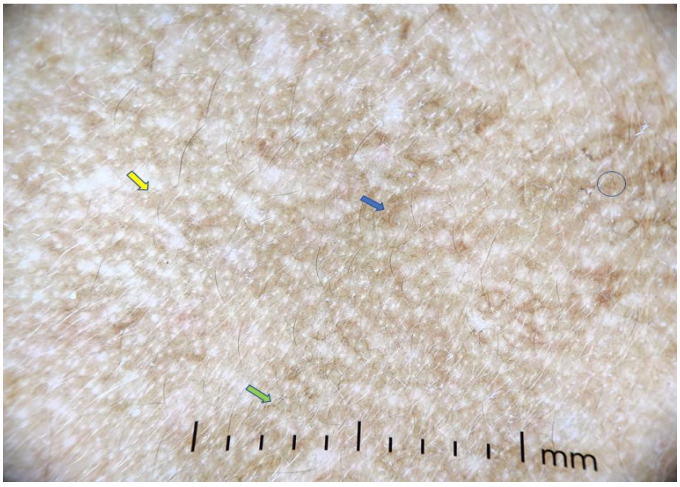

Figure 6: Dermoscopic findings- diffuse dark brown pseudo-network (blue arrow), diffuse light brown pseudo-network (yellow arrow), brown dots & granules (blue circle), arcuate annular structure (green arrow)

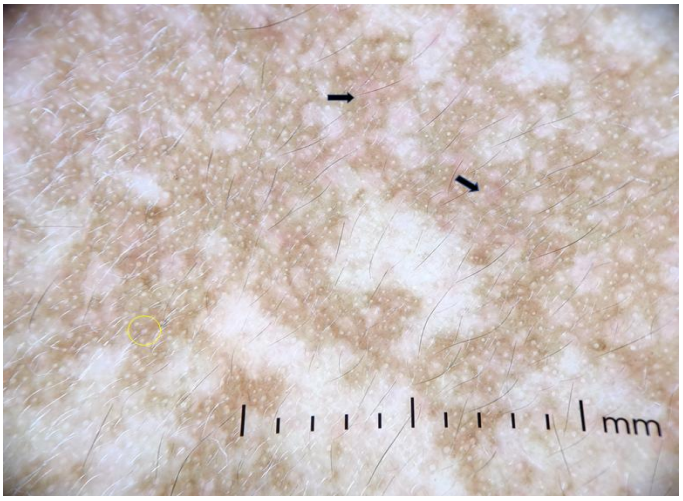

Figure 7: Dermoscopic findings- peri follicular sparing (yellow circle) & increased vascularity (black arrows)

Conclusion

In this study, we noticed that the female gender, family history, onset in pregnancy, hypothyroidism and sun-exposure are some factors which play a role in the complex and multifactorial pathogenesis of melasma. There are only a few studies till date on dermoscopic patterns in melasma in Indian patients. In our study we have evaluated the frequency of dermoscopic patterns in patients with melasma.This may be helpful in early diagnosis of melasma and differentiate it from other facial hypermelanoses.

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