

## Original Research Article

# Melasma: Through the eye of a dermoscope

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### ABSTRACT

**Background:** Melasma is a human melanogenesis dysfunction that results in localized, chronic acquired hypermelanosis of the skin. Dermoscopy is a new non-invasive tool which is used to visualise the pigment colour and distribution. This study was undertaken to explore the usefulness of dermoscope in comparison to Wood's lamp in melasma.

**Methods:** A total of 50 patients of melasma were examined clinically, under Wood's lamp and with dermoscope. All the findings were recorded, described and analysed.

**Results:** The data was compared using SPSS software and the degree of agreement between Wood's lamp and dermoscopy was found to be substantial ( $K = 0.833$ ,  $p < 0.001$ ).

**Conclusions:** Dermoscopy is better tool in determining the depth of pigmentation. It gives an additional advantage to visualize the vasculature.

**Keywords:** Melasma, Dermoscopy, Wood's lamp

### INTRODUCTION

Melasma is a human melanogenesis dysfunction that results in localized, chronic acquired hypermelanosis of the skin. It occurs symmetrically on sun exposed areas of the body, and affects especially women in menacme. Wood's lamp is a handy device which is being used for many decades to determine the depth of pigmentation. Dermoscopy is a new non-invasive tool which is used to visualise the pigment colour and distribution and also helps to rule out steroid abuse in the form of telangeiectasia on dermoscopy. This study was undertaken to explore the usefulness of dermoscope in comparison to Wood's lamp in melasma.

### METHODS

Study of the dermoscopic features and Wood's lamp features of melasma were compared using the Kappa coefficient (proportion of agreement when two observers individually classify a sample). All patients were

explained of the study. Signed, informed and image consent was taken. A detailed history regarding the onset, progression and previous treatment was recorded. Based on distribution, melasma was clinically classified as centrofacial and malar. The melasma was examined under Wood's lamp (Derma India) and was classified as epidermal when there was enhancement of the lesion, as dermal when no enhancement was seen and as mixed when few areas showed enhancement. Dermoscopic examination was done using Dermlite DL3 dermoscope. On dermoscopy, melasma was considered as epidermal when regular pigment network with a brownish homogenous pigmentation was noted, as dermal when irregular network with bluish grey pigmentation was noted and as mixed when areas showed both features.

### RESULTS

Total of 50 patients were included in the study, of which 25 were male and 25 were female. Their ages ranged between 26 and 50 years, with mean age of 39.133 years.

On clinical examination, 22 patients had centropacial distribution and 28 had malar distribution of melasma as shown in Table 1. Under Wood's lamp examination, 19 were classified as epidermal as in Figure 2, 27 patients were classified as dermal and 4 were classified as mixed melasma as given in Table 2.

On dermoscopic examination, 18 patients were classified as epidermal as seen in Figure 3, 23 patients were classified as dermal as in Figure 5 and 9 were classified as mixed melasma as in Figure 7 i.e., depicted in Table 3.

Results were compared using SPSS software and the degree of agreement between the methods was found to be substantial as presented in Table 4 (K=0.833, p value =<0.001).



Figure 1: Clinical- epidermal melasma.



Figure 2: Wood's lamp examination- epidermal melasma.

Table 1: Clinical diagnosis.

	Frequency	Total
<b>Malar</b>	28	56
<b>Centropacial</b>	22	44
<b>total</b>	50	100

Table 2: Wood's lamp diagnosis.

Wood's lamp feature	Frequency	Percentage
<b>Enhancement seen</b>	19	38
<b>No enhancement</b>	27	54
<b>Few areas enhanced</b>	4	8
<b>Total</b>	50	100

Table 3: Dermoscopy diagnosis.

Dermoscopic features	Frequency	Percentage
<b>Regular network</b>	18	36
<b>Irregular network + bluish gray pigment</b>	23	46
<b>Both</b>	9	18
<b>Total</b>	50	100

Table 4: Kappa statistics.

	Dermoscopy			Total	
	1.00	2.00	3.00		
<b>Wood's lamp</b>	1.00	18	0	0	18
	2.00	1	23	5	28
	3.00	0	0	4	4
<b>Total</b>		19	23	9	50

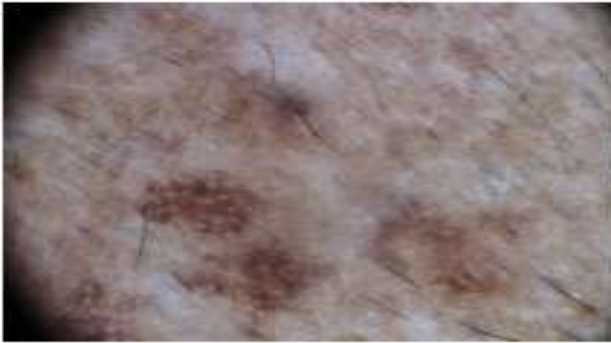
1.00: Epidermal, 2.00: Dermal, 3.00: Mixed; K= 0.833, P value =<0.001



Figure 3: Dermoscopic examination- epidermal melasma.



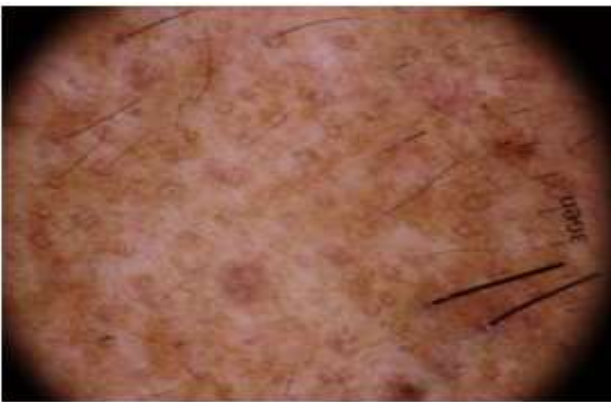
Figure 4: Clinical-dermal melasma.



**Figure 5: Dermoscopy- dermal melasma.**



**Figure 6: Clinical- mixed melasma.**



**Figure 7: Dermoscopy- mixed melasma.**



**Figure 8: Dermoscopy- telangiectasia.**

## DISCUSSION

Melasma predominantly affects adult women and is clinically characterised by blotchy hyperpigmentation of the face particularly the forehead and malar eminences and to a lesser degree lower portion of the cheeks, chin, the upper lip and the sides of the neck.<sup>1</sup>

According to study by Pichardo et al, the prevalence of melasma varies between 1.5% and 33.3% depending on the population.<sup>2</sup> Its prevalence in pregnancy is around 50-70%.<sup>3</sup> The prevalence of melasma in Indian men is about 20.5% to 25.83%.<sup>4,5</sup>

However in our study 50% of the patients were male. This could be because most of our patients belonged to immigrant worker group which is male predominant.

The precise cause of melasma is unknown. Multiple factors that have been implicated in the aetiopathogenesis of this condition are: genetic influences, racial, exposure to UV radiation, pregnancy, oral contraceptives, estrogen progesterone therapies, thyroid dysfunction, cosmetics and phototoxic and antiseizure drugs. Among these, genetic influences and exposure to UV radiation are the most important.<sup>6</sup>

Based on the distribution of the facial lesions, melasma has been divided into three types:<sup>6</sup>

- Centrofacial- Involvement of the forehead, cheeks, upper lip and chin.
- Malar- Involvement of cheeks and nose
- Mandibular- Involvement of rami of mandible.

Malar region is more frequently involved among Indians (73%), though centrofacial variant is described as being most common worldwide.<sup>7</sup> However in our study, clinically malar distribution (56%) and centrofacial distribution (44%) were recorded.

Wood's lamp examination (340 nm to 400 nm ultra violet light) can be used to determine the depth of melanin in the skin. Melasma that are more intensely seen under Wood's light examination respond better to topical treatments.<sup>8</sup>

Classification of melasma based on the depth of melanin pigment was given in Table 5.<sup>9</sup> However, some studies suggest that Wood's lamp examination may not be accurate method to determine pigment.<sup>10, 11</sup>

In our study, on Wood's lamp 19 patients showed complete enhancement hence classified as epidermal, 27 patients had no enhancement hence classified as dermal and 4 patients showed few areas of enhancement and hence classified as mixed melasma.

Dermatoscope is a non-invasive, diagnostic tool, also known as dermoscope, skin surface microscope,

epiluminescence microscope and episcopes. It magnifies subtle clinical surface features of skin lesions and also

unveils some subsurface skin structures not normally visible even with a magnifying lens.<sup>12</sup>

**Table 5: Classification of melasma based on the depth of melanin pigment.<sup>9</sup>**

Type	Normal light	Wood's lamp	Histology	Response to t/t
<b>Epidermal</b>	Light brown	Enhancement of contrast	Melanin deposition in basal and suprabasal layers in epidermis	Good
<b>Dermal</b>	Bluish gray	No enhancement	Melanin laden melanophages seen in superficial and mid-dermis	Poor
<b>Mixed</b>	Dark brown	Some areas show contrast enhancement	Melanin deposition found in the epidermis and dermis	Partial
<b>Wood's lamp not apparent in patients with dark skin types V and VI</b>	Bluish gray/unrecognized	Not evident under Wood's light	Melanin deposition in the dermis	Unpredictable

Dermoscopy of melasma shows very characteristic changes. The colour intensity of melanin and the regularity of the pigment network reveal the density and location of melanin. It presents dark brown colour and well defined network when located in the stratum corneum; shades of light brown and irregularity of the network when located in the lower layers of the epidermis sparing the follicles and sweat gland openings producing exaggerated pseudonetwork pattern with concave borders called the 'jelly sign' and blue or bluish-gray colour when located in the dermis. It is possible to see the vascular component, which is present in a large number of patients.<sup>12</sup>

There are few reports which suggest a sudden increase in the number of cases of exogenous ochronosis (EO). Dermoscopy may be an important tool to differentiate EO from melasma. Greyish brown black amorphous structures in the perifollicular region are suggestive of EO. These are seen obliterating the follicular openings.<sup>13</sup>

Dermoscopy also allows the observation of significant vascular component in melasma which constitutes a new syndrome called telangiectatic melasma as shown in Figure 8.<sup>14</sup>

In our study on dermoscopy, 18 patients showed regular pigment network with a brownish homogeneous pigmentation hence classified as epidermal, 23 patients showed Irregular network with bluish grey pigmentation hence classified as dermal and 9 patients showed features of both epidermal and dermal and hence classified as mixed melasma.

## CONCLUSION

Dermoscopy is a useful, non-invasive diagnostic tool which can be used to examine various pigmented and non-pigmented lesions as it helps in observing the pigment colour and its distribution in the skin layers.

Therefore it helps in classifying melasma objectively. It is less affected by such factors as the patient's skin type, vascular and collagen changes, or the use of topical products. The degree of agreement in between Wood's lamp and dermoscopy is substantial by statistical analysis. Therefore dermoscopy is a more applicable, more appropriate method for routine diagnosis, assessment and monitoring of patients on treatment. Dermoscopy also allows the observation of significant vascular component in many patients, which may be relevant in terms of future prospects for pathogenesis and therapeutic considerations.

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