ABSTRACT
INTRODUCTION- Melasma is a hyperpigmentary disorder resulting in areas of pigmentation with irregular outline depending on the level of melanin deposition in skin. Skin pigmentation can be attributed to various causes different for circumscribed and diffuse hyperpigmentation. Clinical diagnosis though easy is better supported by tools such as wood's lamp and dermoscope thereby helping in making the diagnosis more accurate and sometimes helping in monitoring the response after treatment. Conventionally used Wood’s lamp classified melasma into epidermal, dermal and mixed types. These types are better categorised by dermoscopy which is a new non-invasive office tool, coming with extra benefits. This study aims to demonstrate precision of dermoscopy over Wood’s lamp and encourages its use.

MATERIAL AND METHODS- A cross sectional study of 100 patients diagnosed clinically as melasma was conducted over a period of seven months. Each patient was assessed by Wood’s lamp and then with dermoscope. Photographs were taken and clinically noted epidermal, dermal and mixed melasma types were confirmed according to the tool used. Results were compared and analysed.

RESULTS- Out of 100 patients, Wood’s lamp classified 62, 30, 8 patients into epidermal, dermal and mixed melasma respectively while dermoscopy classified 43, 28 and 29 into the same. Comparison was done between the results of Wood’s lamp and dermoscopy and the degree of agreement was found to be substantial. (k= 0.6646, p<0.001%)

CONCLUSION- Dermoscopy, has a broader usage over Wood’s lamp to determine the level of pigment. It also gives an edge to study the vascular and follicular features not visible through Wood’s lamp.

KEY WORDS- Melasma, Dermoscopy, Wood’s lamp, Pigment pattern.
exposed areas seem to have a predilection for melasma to develop suggesting the role of UV radiation which seem to increase the functioning of melanocytes.

Multifactorial etiology has been proposed including genetic and environmental factors, hormonal, UV radiation and vascular pathogenesis. Oral contraceptive pills and hyper estrogenic states, drugs such as phenytoin, thyroid disorder contribute to aggravate it.

Melasma is classified as epidermal, dermal and mixed depending on the depth of the melanin pigment in the skin. Since these varieties respond to treatment differently it is necessary to classify it to further explain the prognosis and monitor the response.

Melasma is a clinically appreciable condition yet tools such as Wood’s lamp and dermoscopy are needed to differentiate it from other similar pigmented disorders such as exogenous ochronosis, pigmented contact dermatitis, lichen plano pigmentosus, erythema dyschromicans perstans.

Wood’s lamp depending on the enhancement identifies the epidermal component of melasma but fails to demonstrate the hidden dermal component of mixed melasma.

Dermoscopy is a non-invasive office equipment which not only assesses the pattern of pigmentation, but also its level, vascular component, perifollicular changes, scaling and monitoring the treatment response. Melanin pigmentation appeared as well-defined regular brown network in superficial epidermis, irregular network in lower epidermis and bluish grey in dermis.

Histopathological diagnosis is confirmatory for any pigmentary disorders yet it carries the risk of facial scar, post inflammatory changes and is cumbersome.

MATERIAL AND METHODS

Study type: cross sectional study.

Study was carried out at Dermatology department in a tertiary care centre in Gujarat from September 2020 to March 2021.

Inclusion criteria: 100 patients of clinically suspected melasma attending the dermatology out patient department irrespective of treatment taken were included in the study who gave consent.

Exclusion criteria: Those who did not given consent and have a clinical picture suggesting of pigmentary disorders not resembling melasma.

After taking informed consent, patients details including history regarding onset, duration, treatment, oral contraceptive pills, autoimmune disorders and clinical examination were recorded in proforma and photographs taken.

Patients were subjected to Wood’s lamp examination and were categorised as epidermal if enhancement was seen, dermal if there was no enhancement and mixed type if certain areas showed enhancement.

Dermoscopic examination using Dermlite DL3 dermoscope in non-polarised mode was done and three images were captured. Through dermoscopy 10 times magnification was achieved. Pattern of pigmentation, intensity of colour, vascular structures, perifollicular areas were studied. Results were analysed and categorisation was done. Regular brown homogenous pigmentation was considered as epidermal melasma, bluish grey irregular pigmentation as dermal and both features as mixed type of melasma.

Comparative analysis was done between the results of both Wood’s lamp and dermoscopy tools using R-4.1.0 software.
RESULTS

Out of total 100 patients enrolled in the study, 81 were females and 19 were males. Mean age of presentation was 31.9 years ranging from 22 to 48 years.

48 patients gave a history of previous treatment.

On clinical assessment, 58% patients had malar distribution making it the most common pattern, 38% had centrofacial and 4% had mandibular distribution. (Figure 1)

Under Wood’s lamp examination as per the enhancement, melasma was epidermal in 62 patients (63%), dermal in 30 (30%) and mixed in 8 patients (8%) (Table 1).

With dermoscopy, 43 patients (43%) showed epidermal, 28 (28%) dermal and 29 patients (29%) showed mixed pattern (Table 2).
Clinical type - CENTROFACIAL

Wood’s lamp - No enhancement

Dermoscopy - Dermal
Comparative analysis between the findings of Wood’s lamp and dermoscopy can be seen in figure 2.

Figure 1 distribution of melasma on face
Table-1 Wood’s lamp findings

<table>
<thead>
<tr>
<th>Wood’s lamp feature</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhancement seen</td>
<td>62</td>
</tr>
<tr>
<td>No enhancement</td>
<td>30</td>
</tr>
<tr>
<td>Few areas enhanced</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Table-2 Dermoscopic findings

<table>
<thead>
<tr>
<th>Dermoscopic feature</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular network</td>
<td>43</td>
</tr>
<tr>
<td>Irregular bluish grey pigmentation</td>
<td>28</td>
</tr>
<tr>
<td>Both</td>
<td>29</td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
</tr>
</tbody>
</table>

Table-4 shows individual degrees of agreement for epidermal, dermal and mixed melasma with both Wood’s lamp and dermoscopy.

<table>
<thead>
<tr>
<th></th>
<th>Agreement (Kappa Coefficient)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum</td>
<td>Observed</td>
</tr>
<tr>
<td>Epidermal</td>
<td>0.6935</td>
<td>0.6935</td>
</tr>
<tr>
<td>Dermal</td>
<td>0.9333</td>
<td>0.9333</td>
</tr>
</tbody>
</table>

Figure 2. comparative analysis between woods lamp and dermoscopy
Table-3 shows unweighted kappa coefficient 0.6646 demonstrating degree of agreement between both.

<table>
<thead>
<tr>
<th></th>
<th>Observed Kappa</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed</td>
<td>0.2759</td>
<td>0.2759 - 0.4749</td>
</tr>
<tr>
<td>Composite</td>
<td>0.79</td>
<td>0.6947 - 0.8625</td>
</tr>
</tbody>
</table>

In 9% patients, telangiectasias (superficial vessels), pale surface and erythema were noted on dermoscopy suggesting steroid use based on their history.
In 13% patients, dermoscopy revealed greyish brown-black pigmentation around follicles, follicular opening obliteration and telangiectasias suggesting exogenous ochronosis which correlated with the history of topical application.

**DISCUSSION**

Melasma is clinically characterised by increased pigmentation on face affecting women of reproductive age group predominantly. Since treatment of melasma is guided as per the level of pigmentation accurate categorisation seems necessary. In the present study, 81% affected patients were females as in most of the studies.

Based on the distribution pattern on face, melasma is of three types:
Centrofacial melasma involves forehead, cheeks, upper lips, chin. Malar type involves the cheeks and nose while mandibular type involves ramus of mandible. Most common pattern in this study was malar (58%) followed by centrofacial (38%) which is consistent with study by Kaur et al.

In our study, Wood’s lamp classified melasma as epidermal in 63% patients while dermoscopy classified the same in 43 % patients.
Similarly on Wood’s lamp examination, 30% patients were classified to have dermal melasma which on dermoscopy was present in 28 % patients suggesting insignicant difference.
Mixed melasma which was found in 8% patients on Wood’s lamp, was noted in 29 % patients suggesting dermoscopy to be a better tool in identifying dermal pigment in apparent epidermal melasma.
Epidermal melasma responds better to topical treatments which is unsatisfactory for dermal and mixed varieties.
Wood’s lamp on the basis of enhancement suggests epidermal component of melasma only. Dermoscopy studies pigmentation patterns, color intensity and detects dermal melanin which is difficult in the skin of color. Vascular component which can be present in melasma as well as in steroid modified melasma is seen only on dermoscopy.
13 % patients had findings suggestive of exogenous ochronosis which cannot be detected with Wood’s lamp and it further decides the management protocol and prevents further worsening.
of the condition if detected early. Thus, Exogenous ochronosis and melasma can be differentiated well with dermoscopy.

**LIMITATIONS** Small Sample Size and Non-Polarised Dermoscope.

**CONCLUSION**
Dermoscopy provides many benefits over Wood's lamp, therefore in addition to clinical assessment it can boost the diagnostic precision, serve as a prognostic marker, used in monitoring the treatment response. Thus, dermoscopy needs more routine use and can be used as a first line assessment device in patients suspected of melasma.

**REFERENCES**

**CONFLICT OF INTEREST**- Nil
**FUNDING:** Nil
**ACKNOWLEDGEMENT:** Nil