

Role of dermatoscope in diagnosis of clinical subtypes of melasma in comparison with wood's lamp

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Abstract

Objective To evaluate correlation and degree of agreement between dermatoscope and Wood's lamp in diagnosis of melasma sub-types.

Methods This is a cross-sectional study on 89 female with facial melasma from dermatologic clinic of Afzalipour Hospital, Kerman, Iran. Melasma lesions were classified to epidermal, dermal and mixed types with dermatoscope and Wood's lamp. Correlation and degree of agreement between two diagnostic methods were evaluated by Kappa coefficient.

Results Eighty nine females with melasma lesions were enrolled the study. Mean age of the participants was 37.57 ± 6.84 (range 25-53) years old and most of the lesions were located on malar areas (51.3%). Based on Wood's lamp examination, melasma lesions were classified to epidermal, dermal and mixed types in 88.8%, 1.1% and 10.1%, respectively. Based on dermatoscope evaluation, epidermal, dermal and mixed types were observed in 50.6%, 28.1% and 21.3% of the cases, respectively. Correlation between Wood's lamp and dermatoscop was observed in 59.6% of the lesions (Kappa coefficient = 0.232, P. value=0.001).

Conclusion Regarding to higher number of dark-skin phototypes in our geographical region and deeper visualization of dermatoscope to the dermis, dermatoscop is a better choice for determination of clinical subtypes of melasma.

Key words

Dermatoscope; Wood's lamp; Melasma.

Introduction

Melasma is an acquired chronic pigmentary skin disease that presented as symmetric hyperpigmented macules and patches with confluent or reticular pattern on sun-exposed areas of skin.¹ Melasma is most frequently seen in female gender (nearly 90%) and in Hispanic and Asian ethnical groups. Prevalence of disease

according to geographical regions varies from 1.5 to 33.3%.^{2,3} Facial lesions based on site of involvement are classified to centrofacial, malar and mandibular types. Centrofacial lesions usually are the most common types and locate on forehead, cheek, nose, upper lip and chin regions. Malar lesions locate on cheek and nose areas and mandibular lesions locate on ramus of mandible.⁴

Depth of involvement and location of pigment have an important role in selection of treatment. Melasma based upon the depth of involvement is categorized to epidermal, dermal and mixed types. Epidermal type demonstrates increased

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amount of melanin pigmentation in epidermis especially in basal and supra-basal layer. Dermal type reveals melanophages in upper and mid-dermis.⁵⁻⁷

Wood's lamp is a simple diagnostic method for melasma lesions that emits UV radiation with wavelength of 320-400 nm (peak 365nm). Epidermal and dermal types of melasma under Wood's lamp indicate accentuation of pigmentation and lack of accentuation, respectively. Mixed type demonstrates focal and patchy areas of accentuation. Wood's lamp examination of melasma has low sensitivity and specificity with accuracy approximately 46% particularly in higher Fitzpatrick skin types.⁸

Dermatoscope is a non-invasive novel diagnostic method that has magnifying lens (varied from 6 to 400X). Observation of epidermal type of melasma with dermatoscope shows homogenous brown reticular pseudo-network with sparing of hair follicles and eccrine ducts. Dermal type shows irregular grayish-blue pseudo-network with blue-gray granules and globules in perifollicular areas. Mixed type shows feature of both epidermal and dermal types.^{9,10}

Regarding to higher number of dark-skin phototypes in our geographical region and lack of study to evaluate accuracy of dermatoscope in diagnosis of melasma subtypes in Iran, we decided to evaluate correlation of dermatoscope and Wood's lamp in diagnosis of clinical subtypes of melasma.

Material

This is a cross-sectional study on 89 female with facial melasma lesions from dermatologic clinic of Afzalipour Hospital, Kerman. Firstly, written informed consent was obtained from all the participants, then demographic and clinical features of the patients including age, history of

pregnancy, hormone therapy, endocrine disorders, and prolonged sun-exposure as well as regularity of menstrual cycle were collected. All the patients were examined under Wood's lamp (Waldman WTM) and with dermatoscope (dermoscope video camera (Coscam CCL205, Sometech Cosmetic, Korea).

Melasma lesions were classified to epidermal, dermal and mixed types with either of these methods by two dermatologists, separately. Finally, correlation and degree of agreement between two diagnostic methods were evaluated by Kappa statistics. This study was approved by ethics committee of Kerman University of Medical Sciences by approval code of IR.KMU.REC.1397.397.

Results

Eighty nine females with melasma lesions were enrolled the study. Mean age of the participants was 37.57 ± 6.84 (range 25-53) years and mean duration of the lesions was 4.74 ± 4.21 years. Fitzpatrick's skin types of IV, III and II were detected in 36%, 54% and 10% of the participants. Most of the lesions were located on malar areas (51.3%) and other sites of involvement were centrafacial (35.9%) and mandibular (12.8%). History of pregnancy and taking oral contraceptive pills (OCP), thyroidal disorders and irregular menstruation were observed in 74.2%, 40.4% 19.1% and 62.9% of the participants, respectively. Prolonged sun-exposure was detected in 31.5% of the patients.

Based on Wood's lamp examination, melasma lesions were classified as epidermal, dermal and mixed types in 88.8%, 1.1% and 10.1%, respectively. Based on dermatoscope evaluation, epidermal, dermal and mixed types were observed in 50.6%, 28.1% and 21.3%, respectively (**Table 1**).

Table 1 Correlation between Wood’s lamp and dermatoscope assessment.

<i>Wood’s lamp results</i>	<i>Dermatoscope’s results</i>				<i>P-value</i>
	<i>Epidermal</i>	<i>Dermal</i>	<i>Mixed</i>	<i>Total</i>	
	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	
Epidermal	45(50.6%)	22 (24.8%)	12 (13.4%)	79 (88.8%)	0.001
Dermal	0(0%)	1 (1.1%)	0 (0%)	1 (1.1%)	
Mixed	0(0%)	2 (2.2%)	7 (7.9%)	9 (10.1%)	
Total	45(50.6%)	25 (28.1)	19 (21.3%)	89 (100%)	

Correlation between Wood’s lamp and dermatoscope were observed in 59.6% of the lesions (**Table 1**). Kappa coefficient (Degree of agreement between two diagnostic methods) was 0.232 (P. value=0.001).

In order to evaluate the accuracy of dermatoscope in distinguishing epidermal and mixed types of melasma, after obtained written informed consent, skin biopsies were performed in five patients that had contrast between dermatoscope and Wood’s lamp examination.

Discussion

Melasma is a pigmentary skin disease that based on site of involvement are classified to centrofacial, malar and mandibular types.¹⁻³ In the current study, most of the lesions were located on malar area (50.3%) that was consistent with two studies in India (56%),^{11,12} but centrofacial type was the predominant type in most of the other studies.¹⁵⁻²⁰

Genetic and ultraviolet (UV) exposures contribute the most common factors in the pathogenesis of disease. Other factors includes pregnancy, hormone therapy (estrogen, progesterone, and thyroid drugs), endocrine disorders, antiepileptic drugs (phenytoin), cosmetic products and stress.^{13,14} According to this research, most common factors were history of pregnancy (74.2%), irregular menstruation (62.9%) and taking OCP pills (40.4%). Only 19.1% and 31.5% of our patients had thyroid dysfunction and history of prolonged sun-exposure, respectively.

In the present study, examination of the lesions under Wood’s lamp revealed that 88.8% and 10.1% of the lesions were epidermal and mixed types, respectively and only, one lesion (1.1%) was dermal. Moreover, evaluation with dermatoscope showed that epidermal, dermal and mixed types constitute 50.6%, 28.1% and 21.3% of the lesions, respectively. Whilst, 24.7% of the lesions under Wood’s lamp examination show epidermal pigmentation, dermatoscope evaluation indicates dermal pigmentation. Furthermore, 13.48% of the lesions were classified as mixed type with dermatoscope, while Wood’s lamp examination demonstrates epidermal pigmentation. In a study by Dharni and colleagues, similar to the current study, 16.25% of the lesions were classified as epidermal type with Wood’s examination that were diagnosed as dermal type with dermatoscope.¹⁵

In the present research, correlation between Wood’s lamp and dermatoscope was observed in 59.6% of the lesions that was approximately similar to Dharni et al study (56.25%). Furthermore, in the current study Kappa coefficient was 0.232 (P=0.001). In other similar studies, Kappa coefficient was between 0.565 and 0.833, that likewise the present study was statistically significant.^{11,15,16}

In order to evaluate the accuracy of dermatoscope in distinguishing epidermal and mixed types of melasma, after obtained written informed consent, skin biopsies were performed in five patients that had contrast between dermatoscope and Wood’s lamp examination.

While, Wood's lamp examinations suggest epidermal pigmentation, dermatoscope results show dermal pigmentation. Skin biopsies demonstrate melanophages in upper dermis that were consistent with dermatoscope results.

Regarding to higher percentage of dark-skin phenotypes in the current study, we can conclude that Wood's lamp has low sensitivity and specificity especially in higher Fitzpatrick skin types. Moreover, low penetration of UV to dermis in Wood's lamp examination, application of sunscreen and other cosmetic products and collagen and vascular changes can influence on accuracy of Wood's lamp in detection of melasma subtypes.¹⁷

Dermatoscope is a non-invasive novel diagnostic method that can demonstrate collagen and vascular changes, with better visualization of dermis and is a more reliable method in examination of dark-skin phototypes. Also, it can be used for discrimination of melasma lesions from other pigmentary lesions such as ochronosis and for evaluation of adverse effects of treatment such as telangiectasia.¹⁸⁻²⁰

Conclusion

Regarding to higher number of dark-skin phototypes in our geographical region and most reliable results of dermatoscope relative to Wood's lamp due to deeper visualization of dermis and evaluation of collagen and vascular structures, dermatoscope is a better choice for determination of clinical subtypes of melasma.

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