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Original Research Article

Melasma: a clinico-epidemiological study in the highland Himalayan region of Kashmir

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ABSTRACT

Background: Melasma is an acquired dyschromia present mostly on the sun-exposed areas of the skin. The etiology for melasma is not clear, various factors like genetic or hormonal influences the cause. The aim was to understand the demographical distribution and epidemiological pattern of hyper pigmentation in melasma patients.
Methods: A total of 36 patients participated in the present study at the OPD of Regional Research Institute of Unani Medicine, Srinagar, Kashmir for a period of one year.
Results: In the present study, the mean age of patients with melasma was found to be 30.75±6.74 years, with the age distribution and age of onset ranging between 26 and 36 years. A female preponderance was observed, comprising 29 females and 7 males. Out of the total 36 patients, 21 were married, while 15 were unmarried. The maximum numbers of participants were housewives, and the majority belonged to the upper middle class. Furthermore, 10 patients reported a family history of melasma, whereas 26 patients had no such history.
Conclusions: The present observations demonstrate that the melasma has female predominant, affecting reproductive age group mostly found in upper middle class and housewives.

Keywords: Melasma, Demographical profile, MASI scoring, Epidemiology, Cholasma

INTRODUCTION

Melasma is acquired areas of hypermelanosis usually present on the sun exposed areas of the body. These are brown grey or black patches which are usually centrofacial.[1-6] Melasma means black coloured is derived from Greek word meaning *melas*. It is also called Cholasma meaning green in Greek." Melasma occurs in women of reproductive age group between 30-55 years and mostly in pregnancy therefore it is called as the mask of pregnancy.[7-10] The prevalence in pregnancy is about 50-70%.[11,12] Females are more affected than males with the ratio being 9:1. It occurs mostly in the reproductive age group, but rarely can occur before puberty and after menopause.

The description of the disease has been seen in literature dating back to the time of Hippocrates (470-360 BC). The disease is also described in the ancient classical text "*The Cannon of Medicine*". In modern medical literature Joseph Plank in the book "*Doctrine of Morbis Cutaneis*" has identified seven types of Melasma. The reports on Melasma in modern medical literature are found in 1934 and 1961, respectively.[7,13] Melasma is a common dyschromia and its population prevalence varies according to skin type, ethnic groups, area, time and intensity of exposure to sun.[7] The exact incidence is unknown worldwide. The disease can occur in both sexes, all races and in all age groups.[9,14] Melasma has high prevalence in East Asians, Indians, Pakistani, Middle East, Africans, Hispanics and Brazilian due to greater exposure to sunlight.[15-17] Melasma was found in 25% of Hispanics and

5% Spanish. Amongst Hispanics, American Indian ancestry was seen in 65.3% of patients.[14] The areas which are most exposed to sunlight and UV light, especially the Middle East Asia, Indo China, Africa, Hispanics, Caribbean.[1,8,15-18] There is a potent effect of genes and heredity in the onset of melasma.[19] Many prevalence studies have been conducted worldwide to report the prevalence of melasma, however very limited studies are reported in this direction in highland Himalayan region of Kashmir.

UV radiations also cause increase in the prevalence of melasma. There is a decrease in melasma after use of proper sun protection creams. UV-B and UV-A both increase melanogenesis.[20,21] Due to UV radiations complex cellular interactions take place and due to activation of cytokines and hormones melasma develops.[22] UVR directly increases the melanocyte proliferation, migration and formation. UVR also increases the production of cytokines like interleukin-1 (IL-1) and endothelin-1 and peptides like α-melanocyte stimulating hormone (α-MSH), adrenocorticotrophic hormone (ACTH), produced by stimulated keratinocytes. In turn these peptides increases melanogenesis by stimulation of tyrosinase and tyrosinase related protein 1 (TRP-1) activity.[20] Also the activity of inducible nitric oxide synthase (iNOS) in keratinocyte is increased which causes increased melanogenesis. UVR also causes dermal inflammation leading to fibroblast activation which in turn causes activation of stem cell factor (SCF), c-kit and other inflammatory factors like prostaglandins (PGs) and COX-2 resulting in hyperpigmentation.[23,24] Visible light also plays an important role in melanogenesis.[20] Since Kashmir region has a high altitude of average around 1850 meters above sea level, and temperate conditions compared to rest of the country therefore increasing risk factor for melasma, therefore a demographic study was conducted to access the occurrence of melasma among different age group, age of onset, gender, occupational status, marital status, mizaj, socioeconomic status, seasonal variations and family history.

METHODS

An observational study was conducted at the OPD/IPD of Regional Research Institute of Unani Medicine, Naseem Bagh, Hazratbal, Srinagar, Jammu and Kashmir for a duration of 12 months starting from March 2021. This study was approved by the Institutional Ethics Committee Regional Research Institute of Unani Medicine, Naseem Bagh, Hazratbal, Srinagar. Clinically diagnosed patients of melasma between the age group of 15 to 50 years of all genders were included in the study. Patients with cardiovascular disorders, renal, liver, skin disorders, pregnancy and lactation were excluded from the study. A total of 36 patients were included in the study. Detailed history regarding age, sex, occupation and education of patients, nature and duration of complaints, age of onset, site of onset of lesions, precipitating and exacerbating factors and family history were recorded in a prefabricated proforma. An informed consent was taken from all the patients before the procedure after explaining the benefits, side-effects and risks associated with the procedure. Sample size was calculated using GPOWER software (version 3.0.10), it was estimated that the least number of patients required in each group with 80% power, 80% effect size and 5% significance level is 36.

RESULTS

Out of total number of 36 patients, 8 patients (22.22%) were in the age group of 15-25 years, 21 patients (58.33%) were in the age group of 26-36 years, 6 patients (16.67%) were in the age group of 37-47 years and 1 patient (2.78%) was in the age group of 48-58 years (Table 1).

Table 1: Age group.

Age (years)	Test group		Control group		Total patients	
CI	No.	%	No.	%	No.	%
15-25	0.00	0.00	8.00	44.44	8.00	22.22
26-36	15.00	83.33	6.00	33.33	21.00	58.33
37-47	3.00	16.67	3.00	16.67	6.00	16.67
48-58	0.00	0.00	1.00	5.56	1.00	2.78
Total	18	100	18	100	36	100

The above given data shows the preponderance of the disease in the age group of 26-36 years which indicates that melasma is more persistent in the 3rd and 4th decade of life. The incidence of melasma was found to be higher in females. Out of 36 patients, 29 (80.56%) were females whereas only 7 patients (19.44%) were males (Table 3).

Table 2: Age of onset distribution of patients.

Age (years)	Total patients	
CI	No.	%
15-25	10.00	27.78
26-36	25.00	69.44
37-47	1.00	2.78
48-58	0.00	0.00
Total	36	100.00

Table 3: Gender distribution of patients.

Gender	Total patients	
	No.	%
Male	7.00	19.44
Female	29.00	80.56
Total	36.00	100.00

Out of 36 patients, 21 (58.34%) were married and 15 (41.66%) were unmarried (Table 4). Out of 36 patients

maximum number of patients 15 (36.12%) were housewives followed by students 9 (25%) (Table 5). In the present study out of 36 patients, 19 patients (52.78%) were having *balghami mizāj*, 13 patients (36.11%) were having *damwi mizāj*, 4 patients (11.11%) were having *safrāʾwi mizāj* and no patient having *sawdāʾwi mizāj* registered for the study (Table 6). Out of 36 patients, 15 (41.68%) were from upper middle class, 10 (27.77%) were from lower middle class 6 (16.67%) were from upper lower class 4 (11.11%) where from lower class and 1 patient (2.77%) was from the upper class (Table 7). 72.22% of the patients had no family history of *Kalaf* (Table 8). The maximum number of patients i.e. 69.44% had onset of melasma in the age of 26-36 years.

Table 4: Distribution of patients as per marital status.

Marital status	Total patients	
	No.	%
Married	21.00	58.33
Unmarried	15.00	41.67
Total	36.00	100.00

Table 5: Distribution of patients as per occupational status.

Occupational status	Total patients	
	No.	%
Student	9.00	25.00
Govt employee	5.00	13.89
Businessman	2.00	5.56
Labour	0.00	0.00
House wife	15.00	41.66
Other	5.00	13.89
Total	36.00	100.00

Table 6: Distribution of patients as per Mizaj.

Mizaj	Total patients	
	No.	%
Damvi	13.00	36.11
Balghami	19.00	52.78
Safrāʾvi	4.00	11.11
Sawdāʾvi	0.00	0.00
Total	36.00	100.00

Table 7: Distribution of patients as per socio-economic status (SES).

SES	Total patients	
	No.	%
Upper	1.00	2.77
Upper middle	15.00	41.68
Lower middle	10.00	27.77
Upper lower	6.00	16.67
Lower	4.00	11.11
Total	36.00	100.00

Table 8: Showing distribution of patients as per family history.

Family history	Total patients	
	No.	%
Present	10.00	27.78
Absent	26.00	72.22
Total	36.00	100.00

DISCUSSION

In Table 1, out of total number of 36 patients, 8 patients (22.22%) were in the age group of 15-25 years, 21 patients (58.33%) were in the age group of 26-36 years, 6 patients (16.67%) were in the age group of 37-47 years and 1 patient (2.78%) was in the age group of 48-58 years. The above given data shows the preponderance of the disease in the age group of 26-36 years which indicates that melasma is more persistent in the 3rd and 4th decade of life. These results are in accordance with the study conducted by Achar et al and Ade et al which reported that prevalence of melasma is prevalent in between 3rd and 4th decade of life.[26,27] Shankar et al also reported that the maximum prevalence of melasma was found between the ages of 30-40 years.[25] The high prevalence of melasma in this age group can be justified by hormonal changes in the reproductive age group which is thought to be due to differences in the levels of circulating estrogens during menstrual cycles which is a risk factor for developing melasma.[9]

Out of total number of 36 patients, 25 patients (69.44%) reported that the onset of melasma in the age group of 26 to 36 years, while 10 patients (27.78%) reported that onset of melasma occurred in the age group of 15 to 25 years. However only 1 patient (2.78%) reported that onset of melasma occurred in the age group of 37 to 47 years whereas none of the patient reported onset of melasma in the age group of 48 to 58 years (Table 2). Therefore, perusal of the results indicated that 26 to 36 years of age group is the most common age group for the onset of melasma followed by age group of 15 to 25 years. These results were similar to those reported by Ade et al and Achar et al that the age of onset of melasma was between 20 to 30 years with the mean age being around 27.5±7.8.[26,27] The outcome of the age of onset distribution (Table 10) coincides with the age distribution results of patients depicted in Table 1, that highest number of patients were from the age group of 26 to 36 years followed by 15 to 25 years. However, there is no statistical difference with the p value equal to 0.435 in the onset distribution between the control and test group.

In the present study out of 36 patients, 29 (80.56%) were females whereas only 7 patients (19.44%) were males (Table 3) which suggest that females are more prone to develop melasma as compared to males. Hormonal influences in female particularly in pregnancy and due to use of oral contraceptive pills can be an important factor responsible for higher prevalence of melasma in females.[11]

Fisher's exact test was used to determine if there was a significant association between the patient group and the gender. From the analysis it was observed that there is no association between gender of the patients and the patient groups. The prevalence melasma according to gender recorded in the present study corresponds to the finding of Adalatkhan et al, Ishiy et al and Achar et al who suggested that melasma is more prevalent in females as compared to males.[17,26,32]

The data with regards to distribution of patients as permarital status indicated that out of 36 patients, 21 (58.34%) were married and 15 (41.66%) were unmarried (Table 4). The present data suggests that out of 21 married patients 18 (85.72%) were females and 3 (14.28%) were males while as out of 15 unmarried patients 11 (73.33%) were females and 4 (26.67%) were males. Therefore, it can be presumed that pregnancy, OCP's and hormonal imbalance are contributing factors for melasma, since these risk factors are more common among married females. These findings are in agreement with the findings of Shankar et al who suggested that melasma is more prevalent in married women.[25]

The study reveals that out of 36 patients maximum number of patients 15 (41.66%) were housewives followed by students 9 (25%), while as no patient from labor class visited the OPD during the course of my study (Table 5). Sun exposure is considered as one of the reasons for melasma, but in our study housewives who are least exposed to sun as compared to other socio economic classes of the study showed highest incidence of melasma. Therefore, the outcomes of these findings demonstrate the importance of hormonal influence in the aetiology of melasma.[28] The findings of the present study are in concomitance with the previous findings reported by Halder et al and Qazi et al which showed high prevalence of melasma among housewives.[29,30] Mohammad et al evaluated vitamin D levels in melasma patients and reported that vitamin D levels in melasma patients was lower than in control group.[31] Based on the outcome of their findings they concluded that it may be important to recommend vitamin D as a supplement in the treatment of melasma especially in females. Due to lower sun exposure housewives usually have vitamin D deficiency, therefore highest prevalence of melasma among housewives recorded in the present study can also be attributed to the possible vitamin D deficiency due to less sun exposure. Hence, there is need to conduct in depth studies on a much larger sample size to assess the relationship between vitamin D deficiency and melasma.

Although in classical *Unani* literature it is the excess of *sawdāʾ* produced due to various factors in the body that gets accumulated under the skin and causes a variety of skin disorders and melasma is one such disorder.[13,32,33] However, there is no convincing data available which indicates that the prevalence of melasma is higher in people of a particular *mizāj*. In the present study out of 36 patients, 19 patients (52.78%) were having *balghami mizāj*, 13 patients (36.11%) were having *damwi mizāj*, 4 patients (11.11%) were having *ṣafrāʾwi mizāj* and no patient having *sawdāʾwi mizāj* registered for the study (Table 6). As such no concrete inference regarding *mizāj* and melasma can be drawn out of the present study due to this disproportionality in the sample size of the patients of different *mizājs*.

Kuppuswamy socio economic scale was followed to assess the distribution of melasma patient as per socioeconomic status (SES).[34] Out of 36 patients, 15 (41.68%) were from upper middle class, 10 (27.77%) were from lower middle class 6 (16.67%) were from upper lower class 4 (11.11%) where from lower class and 1 patient (2.77%) was from the upper class Table 7. The outcome of the study indicated that upper middle and lower middle class people are at higher risk for melasma development as compared to people belonging to other classes. The possible reason behind this can be that percentage of middle class people is higher in Kashmir compared to other classes. Moreover, people belonging to middle class are ardent and can afford to treat melasma which is which is a cosmetic problem and has social stigma associated with it. Out of 36 patients only one patient 2.77% was from upper class due to lesser population of upper class people in Kashmir, their good food habits and they mostly use sunscreens while exposing to open sunlight. Halder et al also reported higher prevalence of melasma in upper and lower middle class people in their study.

Out of total number of 36 patients, 10 patients (27.77%) had a positive family history of melasma while as 26 patients (72.22) were having no family history of melasma (Table 8). Lesser family history of melasma was observed in the present study could be attributed to the lesser male percentage 19.44% in the study. Sarkar et al reported that main risk factors for melasma for men are sun exposure and family history, while for women risk factors are pregnancy sun exposure and use of oral contraceptive pills.[35] More or less similar findings were reported by Guinot et al in their study conducted on melasma patients.[36]

Limitations

The sample size of the study is small, further studies are needed with a larger sample size and also multi location studies are to be conducted to confirm the demography.

CONCLUSION

To conclude from the present observations that the melasma is female predominant, affecting young married housewives. The disease is more prevalent in the age group of 26-36 years and upper middle class.

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