ORIGINAL RESEARCH PAPER

Dermatology

A CLINICO-EPIDEMOLOGICAL STUDY OF MELASMA IN A TERTIARY CARE HOSPITAL

KEY WORDS: Melasma, Clinical, Epidemological

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ABSTRACT

BACKGROUND: Melasma is a common acquired hyperpigmentary disorder characterized by irregular light or dark brown macules in sunexposed areas of skin. It is a consequence of specific hyperfunctional melanocytes that cause excessive melanin deposition in skin.

AIMS – Our present research aims to study the clinico-epidemological profile and precipitating and aggravating factors of melasma.

MATERIAL AND METHODS – Three hundred patients of melasma attending out-patient department of dermatology were included in the study.

RESULTS – The mean age of melasma patient in our study was 32.3 years with the female to male ratio of 3:1. The mean age of onset was 26.87 years. The mean duration of disease in present study was 6.23 years. Centrofacial melasma and epidermal type were the most common pattern seen. Familial predisposition, pregnancy, sun-exposure were the most common triggering factors observed.

CONCLUSION – The study indicates was melasma has a wide variation in its clinico-epidemological profile and many factors are involved in its etiopathogenesis.

INTRODUCTION:

Melasma, also known as chloasma or mask of pregnancy, is a common, acquired hyperpigmentary disorder, characterized by irregular light or dark brown macules in sun-exposed areas involving the face, neck and less commonly, the hands and the forearms[1,2]. There are three clinical patterns of melasma – centrofacial, malar and mandibular, depending upon the area of localization. Based on Wood lamp examination, melasma is divided into four types – epidermal, dermal, mixed and indeterminate[3]. Many etiological factors have been postulated in the causation and pathogenesis of melasma including pregnancy, oral contraceptives, sun-exposure, genetic factors, cosmetics, phototoxic drugs, anti-seizure medications and thyroid dysfunction[4,5,6]. One third of cases in women and most cases in men are idiopathic[7]. Most studies reporting the prevalence of melasma are based on clinical studies rather than population samples[8,9,10]. However, the prevalence of melasma is higher in women than in men and in blacks than in white population[3,4,5,8]. Melasma is seen more commonly in individuals with Fitzpatrick skin types IV-VI, than in those with fairer skin[4,5]. It is prevalent in Hispanic, Asian and African-American women[10,11]. The prevalence of melasma is higher in women of child bearing age although men also suffer from this condition and account for 10% of cases[4,12]. The prevalence of melasma in previous studies have been reported as 50-70% in pregnant women[13]. Surveys in Iran, Pakistan and France have reported the prevalence as 5-46%, however, none has addressed its global distribution[14-16]. Melasma is a recurrent and refractory problem resulting in cosmetic disfigurement, causing tremendous emotional and psychosocial distress. The understanding of clinic-epidem iology of melasma is important as it helps in recommending the preventive measures and treatment options as well as in possibly reducing the recurrences. According to the natural history of the lesions, melasma may also be classified into transient and persistent types[17].

AIMS AND OBJECTIVES:

To study the clinic-epidemiological profile and precipitating and aggravating factors of melasma.

MATERIAL AND METHODS:

Three hundred consecutive patients with the clinical diagnosis of melasma attending skin OPD of Government Medical College, Chandigarh, were enrolled for the study after taking informed consent. Inclusion Criteria – Only those patients were included in the study who were above 13 years of age and gave consent for the study. Exclusion Criteria – Patients with any other dermatological disease affecting pigmentation. Patients already on treatment for melasma. A single semi-structured questionnaire was administered and comprised questions that basically collected the demog raphic data like age, gender, age of onset of melasma, duration of disease and family history etc. The data of different predisposing factors like sun-exposure, hormonal factors, use of contraception, pregnancy, cosmetics, ovarian tumor and other endocrinal diseases were also included. Clinical evaluation comprised ascertaining the skin type and classifying the type of melasma. Depending upon the distribution of lesions, it was divided into centrofacial, malar or mandibular. Wood's light examination was also done to determine the level/depth of presentation. *Melasma area severity index (MASI)[18] Scoring* – Melasma area severity index is a score, developed by Kimbrough et al, that is used for the assessment of melasma. By this method, the severity of melasma in the patients is assessed by examining each of the four regions (forehead, right malar region, left malar region and chin) and is based on three variables : Percentage of total area involved (A), darkness (D) and homogeneity (H). Numerical value is assigned to area, darkness and homogeneity and total MASI score is calculated by the given formula.

Total MASI score = Forehead 0.3(D+H) A + Right malar 0.3 (D+H)A + Left malar 0.3(D+H)A + Chin 0.1(D+H) A.

MASI score ranges from 0 in the normal individual to 48 in the severe form of melasma.

The data was analyzed by using demographic statistics like mean, standard deviation and mathematic tool like perce ntage and count. Student – t test is used for comparison of various factors like age and duration of disease, etc. The data

was analyzed using SPSS-26 (statistical package for social science).

RESULTS:

Table - 1 Demographic profile of melasma

		Male (72) N(%)	Female (228) N(%)	p-value
Age in years	Range	16-46	20-57	0.000**
	Mean	28.42	33.53	
Age of onset	Range	15-40	15-47	0.054NS
	Mean	25.70	27.24	
Duration	Range	0-10	0-10	0.000**
	Mean	2.80	6.35	
PIH	Present	65(90.3%)	193(84.6%)	0.236NS
Tanning	Present	59(81.9%)	183(80.3%)	0.753NS
Skin type	III	4(5.6%)	23(10.1%)	0.001**
	IV	47(65.3%)	179(78.5%)	
	V	21(29.2%)	26(11.4%)	
Course	Persistent	72(100%)	206(90.4%)	0.001**
	Transient	0(0%)	22(9.6)	
MASI mean	10.87	11.14	0.635NS	
Family history	23(31.9%)	62(27.2%)	0.378NS	
Current pregnancy	-	2(.9%)	-	
Menopause	-	7(3.1%)	-	

PIH (post inflammatory hyper-pigmentation) OCP (Oral contraceptive pill) ** (significant value), NS (non-significant)

A total of 300 patients were enrolled for our study out of which 72 were males and 228 were females. The age of patient ranged from 16 year to 57 years (32.3 $\pm$ 7.2). Maximum melasma patients i.e. 137 (45.71%) were seen in age groups 30-40 years. About 110 (36.71%) of patients were under 30 years and 53 (17.7%) were above 40 years of age. The age of onset ranged from 15 to 47 years (26.87 $\pm$ 6.47). The duration of disease ranged from 0-10 years (mean 60.23 $\pm$ 0.56).

Table- 2 Characteristic of melasma

Parameter	Group	Gender		Total
		Male	Female	
	Malar	33(45.8%)	100(43.9%)	133(44.3%)
Type of melasma	Centro-facial	39(54.2%)	125 (54.8%)	164(54.4%)
	Mandibular	0(0%)	3(1.3%)	3(1%)
Site onset	Cheek	41(50.6%)	128(51.8%)	169(51.5%)
	Forehead	5(6.2%)	9(3.6%)	14(4.3%)
	Nose	35(43.2%)	110(44.5%)	145(44.2%)
Type of lesion	Arcute	0(0%)	1(.4%)	1(.3%)
	Blotting	12(16.7%)	33(14.5%)	45(15%)
	Irregular	11(15.3%)	42(18.4%)	53(17.7%)
	Linear	1(1.4%)	3(1.3%)	4(1.3%)
	Poly-Cyclic	48(66.7%)	149(65.4%)	197(65.7%)
Wood lamp	Dermal	10(13.9%)	39(17.1%)	49(16.3%)
	Epidermal	32(44.4%)	117(51.2%)	149(49.7%)
	Mixed	30(41.7%)	72(31.7%)	102(34%)
Course	Persistent	72(100%)	206(90.4%)	278(92.66%)
	Transient	0(0%)	22(9.6%)	22(7.33%)
MASI mean		10.87	11.14	11.08

Centro facial melasma was most common and seen in 164(54.4%) patients followed by malar variant 133 (44.3%). Most common type of lesion seen was polycyclic in 197 (65.7%) of patients. Under wood's lamp examination, epidermal melasma was most common pattern seen in 149 (49.7%) patients, mixed pattern was seen in 102 (34%) and dermal was least common pattern seen in 49(16.3%) of patients. Only about 85 (28.31%) patients reported family history of melasma in our study.

Table- 3 Precipitating/Triggering factors of melasma

Factors	Gender		Total
	Male	Female	
Child birth	-	13(5.7%)	13(4.3%)
Hypothyroidism	1(1.4%)	1(0.4%)	2(.7%)
Menstrual irregularity	-	8(3.5%)	8(2.7%)
Menopause	-	6(2.6%)	6(2.0%)
Mustard oil application	1(1.4%)	0(0%)	1(0.3%)
OCP	-	2(.9%)	2(0.7%)
Photo-dermatitis	0(0%)	1(.4%)	1(.3%)
Pregnancy	-	88(38.6%)	88(29.3%)
Stress	3(4.2%)	3(1.3%)	6(2%)
Sun exposure	14(19.4%)	10(4.3%)	24(8%)
Sun burn	3(4.2%)	0(0%)	3(1%)
Idiopathic	50(69.4%)	86(37.7%)	136(45.3%)
Total	72	228	300

OCP (Oral contraceptive pill)

Table-4 Aggravating cause of melasma

Factors	Gender		Total
	Male	Female	
Child birth	-	2(.9%)	2(.7%)
Hypothyroidism	0(0%)	2(.9%)	2(.7%)
Menstrual irregularity	-	6(2.6%)	6(2%)
Mustard oil application	15(20%)	15(6.6%)	30(10%)
Pregnancy	-	1(.4%)	1(.3%)
Stress	8(11.1%)	14(6.1%)	22(7.3%)
Sun exposure	37(51.4%)	128(56.2%)	165(55%)
Sun burn	1(1.4%)	20(8.8%)	21(7%)
None	11(15.3%)	40(17.5%)	51(17%)
Total	72	228	300

Hypothyroidism was identified as a triggering cause in 2(0.41%) patients and aggravating cause by 2(0.91%). Mustard oil application was a triggering factor in 1(1.41%) male patients but aggravated melasma in 30(10%) both sex patients. Pregnancy was a triggering factor in 88(38.6%) females and aggravating cause in 1(.41%) females. Stress seems to be a precipitating factor in 6(2%) patients and aggravating cause in 22(7.3%) patients. Sun exposure was triggering cause in 24(8%) patients and aggravated melasma in 165(55%) patients. 195(65%) patients had sun exposure of two hours daily. 74 had exposure to sun during hottest hours (11 am to 4 pm). 45% (151) had exposure due to occupation. In our study 15(5%) of patients were using hormonal contraceptives of which 13 were using CuT and two were using OCP's. Menstrual irregularity was reported as a triggering factor in 8(3.5%) and aggravating factor in 6(2.6%). Amongst 228 female studies, the melasma area severity index (MASI) score ranged from 1.2 to 27.0 with a mean value of 11.14 $\pm$ 4.28. Amongst the 72 male studied, the MASI score ranged from 4.8 to 20.4 with the mean value of 10.87 $\pm$ 4.19.

DISCUSSION:

In present study, 24% patients were males and 76% were females with male female ratio of 1:3. This is in accordance with study done by Sarkar et al. and Achar and Rathi[19,24]. However, this is in contrast with a previous study from Puerto Rico, where it was seen that men constituted only 10% of total melasma patients[8]. These studies support the view that melasma appears to be more prevalent in men of Indian and hispanic origin. But melasma appears to be more common in

Indian females than males as seen in present study. The mean age of melasma patients in our study was 32.3 ± 7.286 which is again in concordance with study done by Achar and Rathi[24]. However, a study from Singapore reported the mean age to be 42.3 years[20]. The age of onset was 26.87 ± 6.47, which is again similar to the age of onset that was seen in study by Achar and Rathi (29.99 years). In Singapore based study the age of onset was 38 years. The duration of disease in present study was 5.47 ± 0.568 while in Singapore based study and study by Achar and Rathi, it was around 4 years[24]. Centrofacial melasma was most common type of melasma seen in present study both in male and females. Our findings matched, the studies done by Achar and Rathi and Guinot et al.[23,24]. However, in a study done by Sarkar et al. malar variant was most common type of melasma in males (61%) and centrofacial was most common type in females (51%). Positive family history was seen in 28.33% of patients in our study which is in correlation with study done by Achar and Rathi and other previous studies where it varied from 20 to 70% in melasma patients according to populations[19 to 24]. A statistically significant association was observed between skin phototype and the prevalence of melasma in an Iranian study by Deharo et al and also in Tunisian study by Guinot et al[21,23]. These data support the fact that skin type 4 and 5 are most commonly affected by melasma. In present study under wood's lamp, epidermal melasma was most common. Similar, findings were seen in study by Sarkar et al and Nicolaidou et al where epidermal melasma was most common[19,20]. However, in study by Achar and Rathi dermal variant was most common[24]. Sun exposure was a triggering course in 4.3% females and 19.4% males while it was aggravating cause in 56.2% females and 51.4% males. Sun light was reported as a major aggravating cause by Sarkar et al, Guinor et al and Achar and Rathi[19,23,24]. Mustard oil was found to aggravate melasma in 20% male and 6.67% females. Mustard oil is a common photosensitizer and contains a volatile compound allylisothiocyanate which is linked to facial pigmentation. Stress is also reported as a important factor in inducing melasma. In our study 6.1% females and 11% males reported it to be an aggravating cause. In present study, pregnancy was a triggering factor in 38.6% females and aggravating cause in 0.4% females. Studies by Guinot et al and Ortonne et al also linked pregnancy as a triggering course of melasma[22,23]. Pregnancy appeared to aggravate melasma by combination of factors viz including UV light exposure, increase level of melanin stimulating hormone and post-inflammatory phenomenon. In the present study oral contraceptive pill (OCP) was found as a precipitating factor in 2(.9%) females. Similar, result were seen in study by Guinot et al and ortonne et al[22,23]. Melasma due to OCP's is explained by stimulation of melanogenesis by oestrogen and progesterone. In our study hypothyroidism was identified as a triggering course in 1(0.4%) females and aggravating cause by 2(0.9%) females. However, this association was not proven in study done by Guinot et al[23]. In a study done by Achar and Rathi 6.4% of patients with melasma had hypothyroidism[24].

CONCLUSION:

Present study of 300 patients was mainly done to assess the etiological factors and epidemiology of melasma. Centrofacial melasma was most common clinical variant and epidermal melasma was most common type observed. It was seen that melasma is more prevalent in females as compared to males. Although no single cause/epidemiological factor for melasma was seen but sun exposure, family history, oral contraceptive use, pregnancy, mustard oil, stress, hypothy roidism were seen to be important in its causation.

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