

A Retrospective Study on the Clinical Presentation and Treatment Outcome of Melasma in a Tertiary Dermatological Referral Centre in Singapore

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ABSTRACT

Background: This is a retrospective study on the epidemiology of 205 patients with melasma seen in a tertiary dermatological referral centre in Singapore.

Patients: The mean age of the 205 patients with melasma was 42.3 years with a female preponderance of 21:1 female to male ratio. There were proportionally more Chinese with melasma than the other races compared to the racial distribution of patients attending our clinic. Ninety percent of our patients had skin type III or IV. The mean age of onset of melasma was 37.6 years. Most sought treatment only 5 years after the appearance of their melasma. Forty-six percent of melasma were light brown, the majority of which were distributed on the malar areas (89%). More than $\frac{2}{3}$ had epidermal melasma. Eighty-eight percent had mild localised melasma (occurring on < 20% of the total facial area). Only 26.8% of our patients reported sun exposure, 25 (12.1%) reported pregnancy and 27 (13.1%) reported oral contraceptives as precipitating factors. A positive family history of melasma was observed in 21 (10.2%) patients.

Sunscreen forms the backbone in the treatment of melasma in our patients. Most patients were prescribed a sunscreen together with hydroquinone containing bleaching cream (54%) as first line treatment. Patients with epidermal type of melasma responded slightly better to treatment than those with dermal type of melasma (28% experienced > 25% reduction in pigmentation compared to 16% respectively (n.s.)).

Conclusion: Overall, 53% of our patients experienced some reduction of pigmentation with 28% experiencing > 25% reduction and 7% experiencing > 75% reduction. In 40%, the pigmentation remained stable with treatment. Treatment of melasma remains an enigma. More studies need to be undertaken to improve treatment response to alleviate the psychosocial impact melasma has on the patient.

Keywords: skin pigmentation, chloasma, bleaching cream, sunlight

INTRODUCTION

Melasma is an acquired hyperpigmentary skin disorder characterised by irregular light to dark brown macules occurring in the sun-exposed areas of the face and neck. Aetiologic factors and aggravating factors in melasma include genetic predisposition, exposure to ultraviolet light, pregnancy and hormonal therapy. It is reported to be a common pigmentary disorder in Orientals⁽¹⁾. The exact prevalence of melasma in most countries is unknown. It is a very common skin disorder, accounting for 0.25% to 4% of patients seen in dermatology clinics in South East Asia⁽²⁾. The estimated prevalence of melasma is estimated to be as high as 40% in females and 20% in males⁽²⁾.

Treatment of melasma is often unsatisfactory. Many therapeutic regimens using bleaching creams, tretinoin, steroid in various combinations have been used with variable results. Treatment complications including hypopigmentation and hyperpigmentation are well known.

This is a retrospective study on the epidemiology, clinical presentation and treatment outcome of melasma among patients attending the National Skin Centre, a tertiary dermatological referral centre in Singapore.

MATERIALS AND METHODS

Case notes of patients clinically diagnosed to have melasma in the National Skin Centre between January 1995 and December 1995 were reviewed. Melasma was diagnosed clinically in all cases. It is defined as an acquired, light to dark brown macular pigmentation of the face (predominately over the cheeks and/or nose and/or forehead and/or jaws and/or neck areas) where no obvious antecedent skin disorders, such as post-inflammatory pigmentation, pigmented contact dermatitis, Ashy dermatosis etc. can be identified.

The following demographic data were collated viz. age, sex, race, marital status, occupation (classified as "indoor" or "outdoor" work) and predisposing factors to melasma eg. drugs, family history and pregnancy.

Clinical evaluation included, skin colour type⁽³⁾, distribution, type (categorised into epidermal, dermal, mixed)⁽⁴⁾, extent/severity (classified as < 10%,

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10% – 20% and > 20% of total skin area of face) of melasma, treatment received and treatment outcome.

Where information was not available in the case records, attempts were made to obtain the information by contacting the patient by telephone. Where information was not available for a particular patient, the parameter will not be included for analysis. Statistical analysis was carried out using the Chi-square and Fisher exact tests. P values of < 0.05 were considered significant.

RESULTS

Two hundred and five patients were diagnosed to have melasma during the study period. This represented 0.5% of new dermatological consultations seen during the study period. Fifty patients were contacted by telephone to obtain further information on the treatment outcome.

Table I shows the demographic features of the 205 melasma patients. Most patients presented after the fifth decade of life with a female predominance. There appears to be a higher proportion of Chinese with melasma than the other races when compared to the racial distribution of the Singaporean population (Chinese = 75%, Malay = 15%, Indians = 8% and Others = 2%). All our patients belonged to skin types III, IV or V.

Table II shows the clinical presentation of 205 patients with melasma. Most cases of melasma appeared during the fourth decade of life. Most patients sought medical treatment only 5 years after the appearance of their melasma. Most melasma were light brown to brown in colour and the majority was distributed on the malar areas. More than two-third of cases was of the epidermal type.

Of the 205 patients with melasma, 55 (26.8%) reported sun exposure; 25 (12.1%) reported pregnancy and 27 (13.1%) reported oral contraceptives as precipitating or aggravating factors. A positive family history of melasma was observed in 21 (10.2%) patients.

Table II – Shows the clinical features of melasma in our patients

Mean age of onset:	37.6 yrs (SD = 8.3 yrs)
Mean duration of melasma:	55 mths (SD = 51 mths)
Colour of melasma: (n = 104)	
light brown	48 (46%)
brown	33 (32%)
dark brown	15 (14%)
grey	8 (8%)
Type of melasma: (n = 69)	
epidermal	47 (68%)
dermal	20 (29%)
mixed	2 (3%)
Distribution of melasma (n = 196)	
malar	175 (89%)
centrofacial	15 (8%)
mandibular	6 (3%)
Extend/Severity of melasma (n = 60)	
< 10%	36 (60%)
10% – 20%	17 (28%)
> 20%	7 (12%)

Table III shows the treatment and treatment response of the 205 patients. It was not possible to analyse response according to individual treatment regimen, as the cohort for each group was too small for statistical analysis. Sunscreen was most commonly used in treating melasma in our patients. Most patients were prescribed sunscreen with a bleaching (hydroquinone-containing) cream as the first line of treatment. It appeared that those with the epidermal type of melasma responded slightly better to treatment than those with dermal type of melasma (ns). About half of our patients responded to treatment although the majority improved only slightly. About half of our patients' condition remained stable while on treatment.

Patients who were treated with hydroquinone 2% appeared to respond as well as those who were treated with hydroquinone 4% cream (ns).

Table I – Demographic features of study population (n = 205)

Mean age:	42.3 years (SD = 7.7 yrs)	
Sex: (F:M)	196:9 (21:1)	
Marital status: (married:single)	169:35 (5:1)	
Race:		
Chinese	193	(94%)
Malay	4	(2%)
Indian	7	(3%)
Others	1	(1%)
Skin type: (n = 149)		
I – II	0	(0%)
III	63	(42%)
IV	79	(53%)
V	7	(5%)
Occupation: (n = 174)		
Indoor	127	(73%)
Outdoor	47	(27%)

DISCUSSION

Melasma is a common acquired pigmentary disorder in Orientals. There are few reports on the epidemiology of melasma in the medical literature from the Far East. Our report is a retrospective epidemiology study of melasma in patients attending a tertiary dermatological referral centre in Singapore. Pigmentary disorder including melasma, is one of the most common skin disorders seen at the National Skin Centre. In 1996, it was the third most common skin disorder seen⁽⁵⁾.

There were more females than males with melasma in our study concurring with several other reports from South East Asian countries⁽²⁾. Females are more likely to seek cosmetic treatment than males. This may explain the higher proportion of females seeking treatment for melasma in our clinic.

Table III – Treatment and treatment outcome of melasma**Treatment received – 1st line: (n = 205)**

Depigmentation cream*	111 (54%)
Hydroquinone 2% cream	44 (21%)
Hydroquinone 4% cream	39 (19%)
Tretinoin	7 (4%)
Sunscreen only	4 (2%)

All patients received concomitant sunscreens.

Response to 1st line treatment according to type of melasma

	Epidermal (n = 43)	Dermal (n = 13)	Mixed (n = 2)
Stable	17 (40%)	7 (53%)	1 (50%)
< 25% improvement	10 (23%)	3 (23%)	1 (50%)
25% – 75% improvement	7 (16%)	1 (8%)	-
> 75% improvement	5 (12%)	1 (8%)	-
Worse	4 (9%)	1 (8%)	-

Response to 1st line treatment according to treatment regimen

	depigment n = 76	hydroq 2% n = 32	hydroq 4% n = 27	tretinoin n = 7	total n = 142
Stable	27 (35%)	9 (29%)	16 (59%)	5 (72%)	57 (40%)
< 25% impr	18 (24%)	10 (31%)	7 (26%)	0	35 (25%)
25% – 75% impr	18 (24%)	10 (31%)	1 (4%)	1 (14%)	30 (21%)
> 75% impr	6 (8%)	2 (6%)	2 (7%)	0	10 (7%)
Worse	7 (9%)	1 (3%)	1 (4%)	1 (14%)	10 (7%)

depigment = depigmentation cream; hydroq = hydroquinone;

tretinoin = tretinoin 0.025% – 0.05% cream; impr = improvement.

*Depigmentation cream contains tretinoin (0.033%), hydroquinone (1.7%), betamethasone valerate (0.33%) and ascorbic acid (0.2%).

Multiple causative factors have been implicated in the aetiology of melasma including ultraviolet light (sunlight), hormones (oral contraceptives), pregnancy and genetic predisposition. There appears to be an increase in the number and activity of melanocytes in the epidermis in patients with melasma. The melanocytes appear to be functionally altered⁽⁴⁾. In our study, only 12% of our (female) patients noticed pregnancy and 13% noticed oral contraceptives as the precipitating/aggravating factors. Our figures were lower than those reported elsewhere⁽⁶⁾. Pathak reported that oral contraceptive was not the primary cause of melasma. He reported that only 20% of his melasma patients gave a history of using oral contraceptives infrequently⁽⁷⁾. In a report from Thailand, 34% of women with melasma had taken oral contraceptives but about half of them had melasma even before they started taking oral contraceptive pills⁽²⁾. It would appear that contraceptive pills or even pregnancy may not be a significant contributing factor in melasma.

Only 27% of our patients noticed sun exposure as an aggravating factor. This is in great contrast to a report from Thailand⁽²⁾ where 72% of their patients reported that sunlight aggravated their melasma. Pathak reported that sunlight exacerbated all melasma⁽⁷⁾. Singaporeans tend to shun the sun and therefore are less likely to notice if their melasma was sun aggravated. Therefore, it is likely that only those who engage in outdoor work are more likely to notice sun exposure as an aggravating factor. The large proportion (62%) of our patients who were classified as indoor workers supported this.

A positive family history is observed in only 10.2% of our patients. This low rate is surprising as genetic predisposition is considered to be an important factor in melasma. Familial occurrence of melasma has been reported to vary from 20% to 70% of studies⁽⁶⁻⁸⁾.

Melasma has been reported to be more prevalent in Orientals than Caucasians^(1,4). Most of our patients with melasma were of skin types III and IV. This was also a reflection of the predominant skin types in Singapore. The high prevalence of patients with types III and IV skin in our patients was not a reflection of a higher prevalence of melasma in dark skin individuals in our study. Fitzpatrick reported that melasma was a common problem in dark skin type in particular, V and VI skin.

Melasma appears to occur in the early middle age. In our patients, the mean age of presentation was 38 years. Most sought treatment in our clinic only after having the melasma for more than 3 years. This probably represents the age where individuals, in particular females, are more conscious of their appearance.

The colour of melasma in most of our patients was light brown. Half of our patients had light brown pigmentation, followed by brown and rarely light brown or gray pigmentation. It would appear that most of our patients sought treatment for mild pigmentation. Most patients had pigmentation confined to less than 10% of the total facial skin. Malar pigmentation (86%) appears to be the most common distribution for melasma. Centrifacial and mandibular pigmentation were relatively uncommon presentation.

As the pigmentation of most melasma is present in the epidermis, the intensity of the colour contrast of melasma can be exaggerated by viewing with Wood's light (black light). Superficial pigmentation will bring about greater contrast. Pigmentation in the deeper layer of the epidermis or in the upper dermis will not be accentuated by Wood's light. This has resulted in the classification of melasma into "epidermal" and "dermal" type in which accentuation of pigmentation is seen in the former and absent in the latter. Some patients have a "mixed" pattern of melasma where epidermal and dermal melasma are observed on different areas of the skin. Fitzpatrick⁽³⁾ does not believe in the existence of dermal melasma as he postulated that melasma in dark skin cannot be accentuated by Wood's light. Dermal melasma has not been observed in patients with skin types I and II. We noticed a significant difference in the type of pigmentation using Wood's light. Clinically there were definite features to suggest deep-seated epidermal or upper dermal pigmentation (melanophages) in some of our patients with dermal melasma. Perhaps more studies on the histology of melasma should be undertaken to confirm the existence of dermal melasma. Such study will be difficult to undertake as patients with such benign disorder, and who sought cosmetic treatment are unlikely to consent to a skin biopsy.

Response to treatment of melasma is generally unsatisfactory. Our findings indicated that some

patients do benefit from treatment although to a very limited extent. Of the 51 patients with available information on treatment outcome, 22% experienced reduction of pigmentation by more than 25% of baseline. Our findings appear to indicate that patients with epidermal type of melasma responded marginally better than those with dermal type (8% vs 12% with > 75% improvement after treatment respectively – ns).

Hydroquinone 2% – 5% has been used in the treatment of melasma for many years⁽⁹⁾. A recent report indicated that epidermal type of melasma does respond well to topical hydroquinone. Improvements are observed in up to 70% – 90% of treated patients⁽¹⁰⁾. Improvements have also been observed in using low potency topical steroids eg. hydrocortisone 1% cream⁽¹⁰⁾. Topical tretinoin in concentration of 0.05% and 0.1% were reported to significantly reduce hyperpigmentation^(10,11). Griffith et al reported that $^{13}/_{19}$ patients with melasma treated with 0.1% tretinoin improved compared with $^{1}/_{24}$ treated with the vehicle⁽¹²⁾. Improvements were not evident until the 24th week of treatment. Azelaic acid 20% cream used in the treatment of melasma has been reported to show good response with the majority of patients responding to treatment⁽¹³⁻¹⁵⁾.

Ligman and Willis reported good response to topical treatment with a combination of hydroquinone 5%, tretinoin 0.1% and dexamethasone 0.1%⁽¹⁶⁾. Pathak obtained improvement with a formulation that did not include corticosteroids⁽¹⁷⁾. Sanchez et al also reported improvement by combining hydroquinone 2% with tretinoin 0.05% to 0.1% without corticosteroids⁽⁴⁾. Other combination regimens have been reported to give good response⁽¹⁸⁾.

Melasma is a major problem among Orientals. It appears to impart a social stigma that almost amounts to the dysmorphic syndrome⁽³⁾. The psychological effects of melasma have never been assessed. Most doctors prefer to consider melasma as a cosmetic problem with no effective treatment at present. This has driven patients with melasma to seek treatment from cosmeticians and quacks. Treatment methods offered by beauticians can lead to severe complications and exacerbation of their pigmentation disorder.

Current therapeutic approaches are beneficial to some patients, but ineffective for many. Dermatologists should treat melasma as a cosmetic problem and should not

turn them away. Self-treatment of melasma is common and should be discouraged because this frequently leads to complications.

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