

Original Research Article

A clinical and therapeutic study of efficacy of 40% glycolic acid facial peels in melasma

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ABSTRACT

Background: Melasma is an acquired hyperpigmentation of face predominantly affecting women with multiple factors like high estrogen states, genetic factors, sunlight, cosmetics & autoimmune thyroid disease implicated in its etiology. Current therapeutic modalities are beneficial for many patients but for some they may remain ineffective. The objective of the study was on clinical study of melisma and to study efficacy of 40% glycolic acid facial peels in melasma.

Methods: Woods lamp examination was done and patients were classified as having epidermal, dermal or mixed type. 40% glycolic acid peel was carried for a period of 20-30 seconds and was left for a period of 3 minutes or till the development of erythema. The peel was terminated by dilutional effect of washing with cold water. Six peelings were done at 15 days interval.

Results: In total 50 patients, 56% belong to 31-40 years. Females constitute 82%. Majority were housewives (64%). Malar distribution was most common type (90%). Family history was present in 38%. Photo aggravation was present in 56% patients. Onset of melasma was associated with pregnancy in 22%. Epidermal melasma was seen in 62%. >75% improvement in 2%, 51-75% improvement in 14% and 25-50% improvement in 40% patients. Erythema (54%) and burning sensation (56%) were common side effects.

Conclusions: So management of melasma in our patients with superficial glycolic acid peels alone is not highly rewarding.

Keywords: Melasma, Glycolic acid, Woods lamp

INTRODUCTION

Man's obsession with his skin colour is eternal. While a pale complexioned person craves for a healthy tan, a darker one longs for a fairer hue. White or black, any blotchy change in skin colour is viewed with dismay and concern. And if such changes were to occur on areas of skin visible to others, disquiet and distress follow. The treating physician must be constantly aware of the psychosocial impact of pigmentary imperfections, including those caused by melasma.

Melasma is a relatively common acquired symmetric hypermelanosis characterized by irregular, light to gray brown macules and patches involving sunexposed areas.¹ The word chloasma is derived from the Greek word "chloazein" meaning "to be green". Melasma also derives from the Greek "melas" meaning "black". Chloasma, melasma and melanoderma have been used interchangeably in describing the blotchy facial hyperpigmentation. This should be correctly designated melasma rather than chloasma, for green pigment is certainly never seen.²

Based on the distribution of the facial lesions, melasma has been divided into three types.³

Centrofacial: Involvement of the forehead, cheeks, upper lip and chin.

Malar: Involvement of cheeks and nose

Mandibular: Involvement of rami of mandible.

Western literature says the centrofacial type as the most common variant.⁴ However in dark skinned individuals, malar type appears to be the commonest type.⁵ Even among Indians it has been observed that malar type is the commonest type.⁶ Melasma accounts for 0.25% to 4% of patients seen in dermatology clinics in South-east Asia.⁷

Melasma is an acquired hyperpigmentation of the face predominantly affecting women with multiple factors like high estrogen states, genetic factors, sunlight, cosmetics, drugs and autoimmune thyroid disease implicated in its etiology. Historically the treatment of melasma has been challenging and the various modalities of treatment include broad spectrum sunscreens, hydroquinone in various concentration, tretinoin, salicylic acid, glycolic acid, azelaic acid, chemical peels, laser therapy, etc. Current therapeutic modalities are beneficial for many patients but for some they may remain ineffective.

Objectives

1. Clinical study of melasma.
2. To study the efficacy of 40% glycolic acid facial peels in melasma.

METHODS

Study was conducting in two centers (Department of DVL, Vydehi Medical College, Bangalore and Department of DVL, Basaveshwara Medical College, Chitradurga). 50 patients presenting with Melasma (25 from each center) were included. Study was carried out between January 2016 to December 2016 (12 months)

Inclusion criteria

Inclusion criteria were all men and non-pregnant women between 18 and 45 years with melasma who gave written consent for the study.

Exclusion criteria

Exclusion criteria were patients below 18 years and above 45 years; pregnant women; patients on drugs.

A detailed history was elicited with reference to the duration, onset, progression, family history, obstetric history, gynaecologic history, drug history, history of exposure to sunlight and previous treatment. Melasma was graded as mild, moderate or severe based on clinical

examination. Woods lamp examination was done and patients were classified as having epidermal, dermal or mixed type of melasma. All patients were advised daily application of topical sunscreen (SPF 30).

A test peel was done in the left retroauricular area to rule out hypersensitivity to the peeling agent. For the purpose of peeling, the face was divided into anatomic units – right forehead, left forehead, left cheek, right cheek, nose, glabeller and perioral area. After removing the dirt with spirit and degreasing with acetone 40% glycolic acid peel was carried out for a period of 20-30 seconds and was left for a period of 3 minutes or till the development of erythema whichever was earlier, in a preset sequence. The peel was terminated by the dilutional effect of washing with cold water. All the side effects were recorded.

Six peelings were done at 15 days interval. The patients were advised to avoid exposure to sunlight and to report in case of intolerance to peel. Wood lamp examination was done and colour photographs were taken 30 days after the last peel. At the completion of the study the improvement was graded as per the physician global assessment and was carried out using the clinical photographs.

RESULTS

In the present study of 50 patients, 13 patients (26%) belonged to age group 21-30 years, 28 patients (56%) belonged to age group 31-40 years and 9 patients (18%) belonged to age group >40 years. In the present study of 50 patients, 41 (82%) patients were females and 9 (18%) were males.

Table 1: Age distribution.

Age (years)	Number of patients	Percentage (%)
<20	0	0
21-30	13	26
31-40	28	56
>40	9	18
Total	50	100

In the present study of 50 patients, 32 patients (64%) were housewives, 4 patients (8%) were teachers, 2 patients (4%) were agriculturists, 2 patients (4%) were students. Others which comprised of 10 patients (20%) included clerks, office workers, factory workers, beauty parlour worker and driver.

In the present study of 50 patients, 5 patients (10%) had centrofacial pattern and 45 patients (90%) had malar pattern (Table 2).

In the present study of 50 patients, 6 patients (12%) had onset of lesions of duration less than 1 year, 29 patients

(58%) of duration 1-5 years, 11 patients (22%) of duration 6-10 years and 4 patients (8%) of duration of more than 10 (Table 3). In the present study of 50 patients, 19 patients (38%) gave history of similar complaints in atleast 1 first degree relative (Table 4).

Table 2: Pattern of melisma.

Melasma	Number of patients	Percentage (%)
Centrofacial	5	10
Malar	45	90
Mandibular	0	0
Total	50	100

Table 3: Duration of lesions.

Duration (years)	Number of patients	Percentage (%)
<1	6	12
1 to 5	29	58
6 to 10	11	22
>10	4	8
Total	50	100

Table 4: Family history

Melasma in 1 st degree relative	Number of patients	Percentage (%)
Present	19	38
Absent	31	62
Total	50	100

In the present study 28 patients (56%) had photoaggravation. In 9 patients melasma had appeared during pregnancy, use of medication in 2 patients (4%). Menstrual irregularities were present in 3 patients (6%) (Table 5).

Table 5: Aggravating factors.

Factors	Number of patients	Percentage (%)
Photo aggravation	28	56
Pregnancy	9	18
Drugs	2	4
Menstrual irregularities	3	6
Liver disorder	0	0
Total	42	84

In the present study 31 patients (62%) had epidermal melasma, 5 patients (10%) had dermal melasma and 14 patients (28%) had mixed type of melisma (Table 6).

In the present study 1 patient (2%) had >75% improvement, 7 patients (14%) had 51-75%

improvement, 20 patients (40%) had 25-50% improvement, 16 patients had <25% improvement. There was no improvement in 5 patients (10%) and the condition worsened in 1 patient (2%). In the present study of 50 patients, 27 patients (54%) developed erythema, 28 patients (56%) complained of burning sensation, 15 patients (30%) complained of itching, 2 patients (4%) developed desquamation and 2 patients (4%) developed post inflammatory hyperpigmentation.

Table 6: Wood's lamp examination.

	Number of patients	Percentage (%)
Epidermal	31	62
Dermal	5	10
Mixed	14	28
Total	50	100

Table 7: Response to chemical peeling with 40% glycolic acid.

Score	Number of patients	Percentage (%)
0 (>90% improvement)	0	0
1 (76-90% improvement)	1	2
2 (51-75% improvement)	7	14
3 (25-50% improvement)	20	40
4 (<25% improvement)	16	32
5 (no improvement)	5	10
6 (worsened)	1	2
Total	50	100

Table 8: Side effects.

	Number of patients	Percentage (%)
Erythema	27	54
Burning	28	56
Itching	15	30
Desquamation	2	4
Post inflammatory hyperpigmentation	2	4

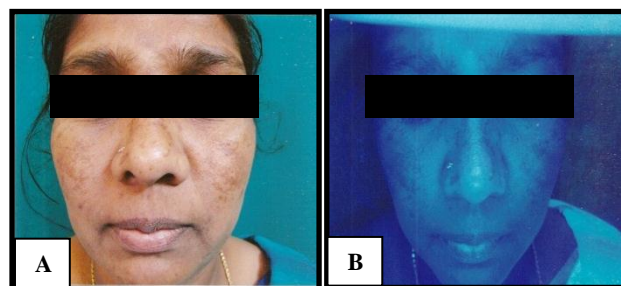


Figure 1: A= Epidermal melisma; B= Accentuation with Wood's light.

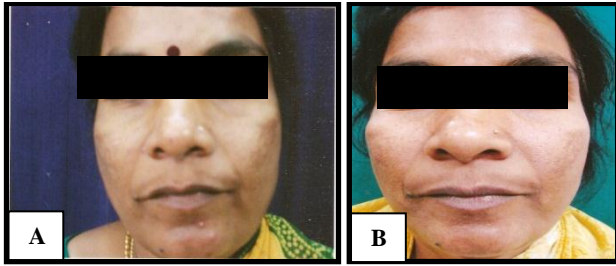


Figure 2: A= Before chemical peeling; B= After 6 peels with 40% glycolic acid.

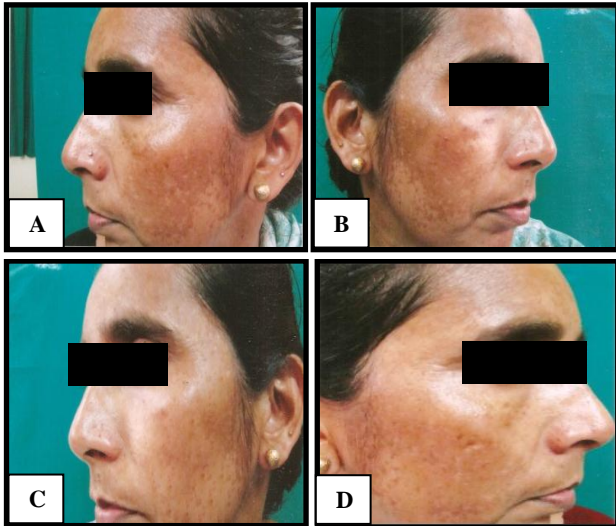


Figure 3: A= Before chemical peeling; B= Before chemical peeling; C= After 6 peels with 40% glycolic acid; D= After 6 peels with 40% glycolic acid.

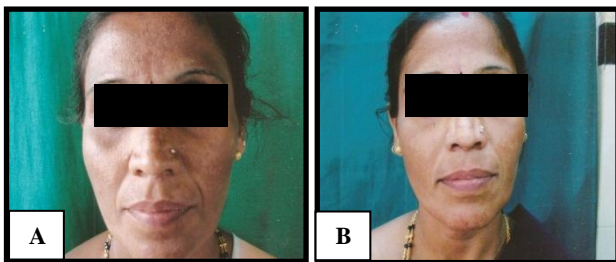


Figure 4: A= Before chemical peeling; B= After 6 peels with 40% glycolic acid.

DISCUSSION

Hurley et al, in their study revealed 44% of patients belonged to age group 31-40 years.⁸ 39% more than 40 years and 17% between 21 and 30 years.

In a study by Kalla et al, 54% of patients belonged to the age group 21-30 years and 33% belonged to age group 31-40years.⁹ In the present study of 50 patients, 13 (26%) belonged to age group 21-30 years, 28 (56%) belonged to age group 31-40 years and 9 (18%) belonged to age

group more than 40 years. youngest being 23 years and eldest 45 years.

Thus the results of the present study are in concurrence with the studies done by other authors. It indicates that melasma is common in third and fourth decade of life.

In a study by Goh et al 95.6% of patients were females and 4.3% were males.¹⁰ A study by Vazquez et al revealed that the incidence of melasma in males was about 10%.¹¹ In the present study of 50 patients, 41 patients (82%) were females and 9 patients (18%) were males.

In the above studies males were affected between 4.3% and 25.83%. Females were affected more than 75%. This indicates females are more affected and cosmetically worried about the pigmentation. The results of the present study are in concurrence with the other studies, which indicates the universal cosmetic problem in females.

In a study by Goh et al 73% of patients' occupation was indoor and 27% was outdoor.¹⁰

In the present study, 84% had indoor occupation and 17% had outdoor occupation. Though 84% of the patients were indoor workers, 56% patients gave history of photoaggravation in the present study. This shows that there is a variable degree of photoaggravation in our patients even with indoor occupation. The higher incidence among housewives can be attributed to the number of females.

In a study by Hurley et al, 72% had malar distribution and 28% had centrofacial distribution.⁸ In a study by Goh and Dlova 89% had malar distribution, 15% had centrofacial distribution and 3% had mandibular distribution.¹⁰ In the present study, 90% of patients had malar distribution and 10% had centrofacial distribution. The results of our study are in concurrence with that of other studies and suggestive of most commonest area to be affected in melasma is malar region.

In a study Javaheri et al in 2001, the mean duration was 60.6 months.¹² In a study by Goh et al in 1999, in 205 patients the mean duration of melasma was 55 months.¹⁰ In the present study, the duration in 12% (6 patients) was less than 1 year, in 52% (26 patients) it was between 1 and 5 years, in 24% (12 patients) it was between 6 and 10 years and in 10% (5 patients) it was more than 10 years. The mean duration of melasma in the present study is 55.64 months.

In the present study 64% of the patients have reported within 5 years of onset of melasma and among those who had melasma between 5 and 10 years, most of them had already received other modalities of treatment without satisfactory improvement. This shows the cosmetic consciousness of the patients in all studies including in the present study.

Kimbrough et al in 1994, in their study of 30 patients revealed a family history in 40% of patients.¹³ Hurley et al, in their study of 18 patients have reported a history of melasma in first degree relative in 44% of the patients.⁸ In the present study, 38% of patients gave history of melasma in at least 1 first degree relative. The results of the present study are almost in concurrence with that of other studies. The review of above studies supports to the familial predisposition for the development of melasma. Vazquez et al in 1988 have reported sun light as an exacerbating factor in 66.6% of the 27 men studied.¹¹ Hurley et al, in their study of 18 patients 39% had photo aggravation.⁸

In the present study, 56% of patients showed exacerbation of melasma following sun exposure.

The above studies show that there is a wide variation in the association between melasma and photoaggravation and the results of our study nearer to the Vazquez et al study Hurley et al, have reported use of hormonal therapy in 22% in their study of 18 patients.⁸ Kalla et al, in their study of 100 patients gave history of drug intake in 8% of patients.⁹ Javaheri et al, in their study of 25 Indian women reported hormone ingestion in 22% patients.¹²

In the present study, 4% gave history of association of melasma with consumption of drugs. 2% (1 patient) had history of oral contraceptive pill and 1 patient gave history of intake of phenytoin. Both of them had stopped the drugs at the time of study. The relatively lower number of patients on drugs in the present study can be attributed to the fact that oral contraceptive pills are the common drugs associated with melasma and most of the present study patients belonged to age group 31-40 years who had completed family and tubectomy is the common method of family planning.

Kalla et al in 2001, reported in their study of 100 patients, 19% of patients gave history of onset of melasma during pregnancy.⁹ Goh et al in 1999, reported in their study of 205 patients in Singapore, onset of melasma during pregnancy in 12.1% patients.¹⁰ In the present study of 50 patients, of which 41 were women, 22% gave history of onset of melasma during pregnancy. Thus the onset of melasma during pregnancy in the present study is almost similar to the observations made in other studies.

In the present study of 50 patients of which 41 were females, 3 patients gave history of menstrual irregularities. Perez et al in 1983, reported menstrual disorder in 44.4% of patients in their study.¹⁴ In view of paucity of available studies a clear cut conclusion could not be drawn with regard to association of melasma and menstrual irregularities.

Hurley et al, in their study of 18 patients reported epidermal type of melasma in 89% of patients, mixed type in 11% and dermal type in none.⁸ Pathak et al in 1986, of 300 patients reported 70% having epidermal

melasma.¹⁵ In a study by Grover et al on 41 patients, 80% had epidermal, 13.3% had dermal and 6.6% had mixed type of melasma.¹⁶

In the present study, 62% (31 patients) had epidermal melasma, 10% (5 patients) had dermal melasma and 28% (14 patients) had mixed type.

Though the woods lamp examination observations in the present study are in concurrence with most of other studies, drawing clear conclusion is difficult owing to the skin type (IV and V) in majority of the present study patients.

In a study by Kalla et al 27.9% showed less than 25% improvement, 22.1% showed improvement between 25% and 50%, 19.1% showed improvement between 50% and 75% and 30.9% showed improvement more than 75%.⁹ Javaheri et al in 2001, in their study of 100 Indian women reported good response in 17% patients, moderate response in 48% patients, mild response in 26% patients and 9% showed no response with glycolic acid.¹² Hurley et al, in their study of 18 patients reported slight improvement in 11.7%, moderate improvement in 29.4%, obvious improvement in 47% and very marked in no patients.⁸ In the present study, 2% (1 patient) showed improvement more than 75%, 14% (7 patients) showed improvement between 51% and 75%, 40% (20 patients) showed improvement between 25% and 50%, 32% (16 patients) showed improvement less than 25%, 10% (5 patients) showed no improvement and 2% (1 patient) worsened following treatment.

Different authors have used different parameters in their studies to evaluate the efficacy of glycolic acid peeling. By observing the results of various studies and the present study it can be said that the response to glycolic acid peeling were different in different studies. The results of the present study goes almost in concurrence with that of Javaheri et al which was done on Indian women, but slightly inferior when compared to other studies.¹² This can be attributed to various factors like India being a tropical country receiving more average sun light compared to temperate countries, the skin type (IV and V), the higher number of patients with photo aggravation. No bleaching agents were used in between the peelings, which was done in most other studies. All the cases which showed no response had dermal/mixed type of melasma.

CONCLUSION

The higher presentation in the age group 31-40 years indicates that it is a disorder among the middle aged. The significantly higher rate of occurrence in females shows that melasma is more common in females and also the cosmetic consciousness among the females. The malar pattern was the commonest type. The family history of melasma in 38% of patients suggests the probable genetic role. Sunlight as an aggravating factor. The onset of

melasma during pregnancy in 18 of 41 women strengthens the hormonal influences in development of melasma. Though epidermal distribution was the common type on Wood's lamp examination it is difficult to draw clear conclusions owing to the skin colour of our patients.

Regarding the response to treatment this study was done to evaluate the efficacy of superficial glycolic acid peels alone in the management of melasma. Though improvement was seen in 88% of patients most of them had mild (32% patients) and moderate (40% patients) improvement. Marked improvement was seen in only 14% patients.

More than half of the patients complained of erythema and burning sensation. The risk of post inflammatory hyper pigmentation even though less (was seen in 4%) can be a drawback. So management of melasma in our patients with superficial glycolic acid peels alone is not highly rewarding.

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Ethical approval: The study was approved by the institutional ethics committee

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