



# International Journal of Dermatology, Venereology and Leprosy Sciences

E-ISSN: 2664-942X  
P-ISSN: 2664-9411  
[www.dermatologypaper.com](http://www.dermatologypaper.com)  
Derma 2020; 3(2): 96-99  
Received: 14-07-2020  
Accepted: 18-08-2020

**Dr. Suma D Gudi**  
Assistant Professor,  
Department of Dermatology  
and Venereology, VIMS,  
Ballari, Karnataka, India

**Dr. Lakshmi pathi**  
Associate Professor,  
Department of Dermatology  
and Venereology, VIMS,  
Ballari, Karnataka, India

## Melasma: Treatment modalities and response to treatment

**Dr. Suma D Gudi and Dr. Lakshmi pathi**

**DOI:** <https://doi.org/10.33545/26649411.2020.v3.i2b.51>

### Abstract

Melasma of the forearms seems to be a relatively common sign. It may be more common in older people and especially in postmenopausal women on supplementary oestrogen. The pigmentary change is macular and may be confluent or speckled. Like facial chloasma there is a sharp line of demarcation at the margins. In some there seems to be an element of erythema. A detailed history was elicited with reference to the duration, onset, progression, family history, obstetric history, gynaecologic history, cosmetic history and previous treatment. The adverse effects were seen in Regime-I. Common side effects were erythema (16.7%), burning (16.7%), Desquamation (6.7%) and pruritus (6.7%). Common side effects in Regime-II were erythema (30%), burning (10%), Desquamation (13.3%) and dryness (23.3%). Common side effects in Regime-III were erythema (33.3%), burning (10%) and Desquamation (6.7%). Common side effects in Regime-IV were erythema (40%), burning (23.3%) and Desquamation (26.7%) pruritus (6.7%).

**Keywords:** melasma, treatment modalities, response to treatment

### Introduction

Melasma is a relatively common acquired symmetric hypermelanosis characterized by irregular, light to gray brown macules and patches involving sun exposed areas of skin.

Melasma is characterized by the insidious development of a blotchy hyperpigmentation of the face. The hyperpigmentation is characteristically blotchy and is predominantly located on the forehead and malar eminences and to a lesser degree, sometimes on the lower portion of the cheeks, chin, the upper lip and the sides of the neck<sup>[1]</sup>.

The condition is generally noticed first during the summer months. The lesions are usually asymptomatic with no evidence of any antecedent symptoms such as burning or itching or any history of inflammation, or severe sunburn or any form of dermatitis. Thus the patient comes to know of the problem when his attention is called to by remarks of acquaintances or other family members and sometimes when he himself becomes aware of its existence and then becomes alarmed as it increases rapidly in intensity<sup>[2]</sup>.

The lesions then begin to gradually merge imperceptively into the normal skin. The lesions are, usually multicentric and symmetrical from the beginning. As it spreads it may merge imperceptively into the normal skin or it may also present as lesions with a distinct border, particularly in the infraorbital region and at the scalp margin. It is very unlikely of the lesion to present as a small lesion which spreads centrifugally.

The lesions are predominantly seen over the forehead and malar eminences and to a lesser degree sometimes on the lower portions of the cheeks, the chin, upper lip and the sides of the neck<sup>[3]</sup>.

The scalp, ears, eyelids are usually spared. Also other sites such as mucous membranes, areolae of the breasts, axillary regions or external genitalia are not involved.

Unusual presentations of melasma have been reported. A unilateral involvement of the face with the other half being normal has been reported.

Melasma of the forearms seems to be a relatively common sign. It may be more common in older people and especially in postmenopausal women on supplementary oestrogen. The pigmentary change is macular and may be confluent or speckled. Like facial chloasma there is a sharp line of demarcation at the margins. In some there seems to be an element of erythema<sup>[4]</sup>.

**Corresponding Author:**  
**Dr. Lakshmi pathi**  
Associate Professor,  
Department of Dermatology  
and Venereology, VIMS,  
Ballari, Karnataka, India

Tabata, *et al* reported a case of band like melasma on the median line of the forehead of a middle aged woman. The colour is essentially of the same intensity in each person, but varies in patient to patient from a shade slightly darker than that of the normal skin to a deep brown. The condition appears to be more prominent and extensive in the more darkly complexioned patients. The lesions are essentially macular with the skin seemingly normal to touch. There is usually no evidence of a dermatitis, follicular plugging, scaling, atrophy, telangiectasia or depigmentation.

### Methodology

After taking consent from the patients the following regimens were followed:

Regimen-1: 30 patients were inducted in this regime. They were advised to apply sunscreens in the morning and hydroquinone. (4%) at night.

Regimen-2: 30 patients were taken taken in this group. They were advised sunscreens in the morning and a combination of retinoic acid + hydroquinone + fluorinated steroid at night. (Modified kligman's regime)

Regimen-3: 30 patients were taken taken in this group. They were advised sunscreens in the morning and azelaic acid cream at night.

Regimen-4: 30 patients were selected for chemical peeling with trichloroacetic acid. Patients were advised prepeeling with hydroquinone and retinoic acid for 3 weeks. All patients were advised sunscreens in the morning. During the peel programme, after taking necessary precautions, patients were advised to wash his/her face with soap and water. The face was then cleaned with spirit. Then one coating of acetone was applied (in required concentrations) starting from forehead - right cheek - chin - left cheek, nasal bridge - nose-perioral area-upper and lower eyelids. The trichloroacetic acid was applied for a particular time period i.e. 30 seconds, 1 minute, 1½ minutes and 2 minutes in different concentrations. It was applied till frosting was seen. The patient were advised to clean his/her face with ice water for termination and neutralization.

All the patients were followed up at 3 weeks, 6 weeks, 12 weeks and 16 weeks.

During every visit, the results were graded as follows-

Grade-I: Slight improvement, barely noticeable (<25%).

Grade-II: Moderate improvement, noticeable (25-50%)

Grade-III: Obvious improvement (50-75%)

Grade-IV: Very marked improvement (> 75%).

Finally, the results were analyzed and tabulated.

### Treatment Regimens

Regimen I: Topical hydroquinone (4%) at night + sunscreens in the morning

Regimen II: Topical application of hydroquinone + retinoic acid + fluorinated steroid at night + sunscreen in the morning.

Regimen III: topical application of 20% Azelaic acid at night + sunscreens in the morning.

Regimen IV: Chemical peeling with trichloroacetic acid (10-20%) with sunscreen in the morning prepeeling with hydroquinone + retinoid for 3 weeks. Informed consent before procedure. 3-5 peels at an interval of 3 weeks depending on the response.

### Grading of response to treatment

Grade I: Slight improvement, barely noticeable (<25%)

Grade II: Moderate improvement, noticeable (25-50%)

Grade III: Obvious improvement (50-75%)

Grade IV: Very marked improvement (>75%)

### Results

**Table 1:** Response to hydroquinone

Grade	No of patients n=30	Percentage
Grade I	12	40%
Grade II	7	23.3%
Grade III	6	20%
Grade IV	5	16.7%

In the present study grade I improvement was seen in 12 patients (40%) Grade II improvement was seen in 7 patients (23.3%) Grade III improvement in 6 patients (20%) and Grade IV improvement in 5 patients (16.7%) with topical hydroquinone.

**Table 2:** Response to Hydroquinone + Retinoic Acid + Fluorinated Steroid

Grade	No. of patients n=30	Percentage
Grade I	9	30%
Grade II	8	26.7%
Grade III	8	26.7%
Grade IV	5	16.7%

In the present study, Grade I improvement was seen in 9 patients (30%), Grade II improvement was seen in 8 patients (26.7%), Grade III improvement in 8 patients (26.7%) and Grade IV improvement in 5 patients (16.7%) with hydroquinone + retinoic acid + fluorinated steroid regimen.

**Table 3:** Response to azelaic Acid

Grade	No. of patients n = 30	Percentage
Grade I	10	33.3%
Grade II	10	33.3%
Grade III	5	16.7%
Grade IV	5	16.7%

In the present study Grade I improvement was seen in 10 patients (33.3%) Grade II improvement was seen in 10 patients (33.3%) Grade III improvement in 5 patients (16.7%) and Grade IV improvement in 5 patients (16.7%) with azelaic acid regimen.

**Table 4:** Response to chemical peeling with trichloroacetic Acid

Grade	No. of patients n = 30	Percentage
Grade I	12	40%
Grade II	5	16.7%
Grade III	8	26.7%
Grade IV	5	16.7%

In the present study Grade I improvement was seen in 12 patients (40%) Grade II improvement was seen in 5 patients (16.7%), Grade III improvement in 8 patients (26.7%) and Grade IV improvement in 5 patients (16.7%) with chemical peeling with trichloroacetic acid.

**Table 5:** Adverse Effects

	Regime I		Regime II		Regime III		Regime IV	
	No of patients	%	No of patients	%	No of patients	%	No of patients	%
Erythema	5	16.7%	9	30	10	33.3	12	40
Burning	5	16.7%	3	10	3	10	7	23.3
Desquamation	2	6.7%	4	13.3	2	6.7	8	26.7
Pruritus	2	6.7%	-	-	-	-	2	6.7
Dryness	-	-	7	23.3	-	-	-	-
Atrophy	-	-	-	-	-	-	-	-

The adverse effects were seen in Regime-I. Common side effects were erythema (16.7%), burning (16.7%), Desquamation (6.7%) and pruritus (6.7%). Common side effects in Regime-II were erythema (30%), burning (10%), Desquamation (13.3%) and dryness (23.3%). Common side effects in Regime-III were erythema (33.3%), burning (10%) and Desquamation (6.7%). Common side effects in Regime-IV were erythema (40%), burning (23.3%) and Desquamation (26.7%) pruritus (6.7%).

**Table 6:** Comparison of various treatment regimes

Grade	Regime I		Regime II		Regime III		Regime IV	
	No of patients	%	No of patients	%	No of patients	%	No of patients	% !
Grade I	12	40	9	30	10	33.3	5	16.7
Grade II	7	23.3	8	26.7	10	33.3	5	16.7
Grade III	6	20	8	26.7	5	16.7	8	26.7
Grade IV	5	16.7	5	16.7	5	16.7	12	40
Total	30		30		30		30	

Regime IV> Regime II>Regime III>Regime I, The differences were compared by chi square test. Regime-IV showed significantly better response compared to Regime I as reflected by chi square  $\chi^2=4.02$  &  $p=0.045$  ( $P<0.05$ ). Other comparisons were found to be not significant.

## Discussion

Response to TCA was Grade I improvement in 16.7% patients, Grade II improvement in 16.7% patients, Grade III improvement in 26.7% patients and Grade IV in 40% patients.

Gupta A K, Gover MD *et al* [5] in their study in 2006, showed 55% of patients with melasma experienced a good clinical response with TCA peels.

Kalla *et al* [6], in 2001 in their study of 32 patients showed <25% improvement in 12.5% (4 patients) 25-50% in 25% (8 patients) 50-75% in 34.4% (11 patients) and >75% improvement in 28.1% (9 patient) with trichloroacetic acid.

Thus the results with trichloroacetic acid peeling are different in different authors and our study results were found to be more superior in comparison with other regimens. Better compliance with chemical peels compared to self application of other regimens may also be a contributing reason.

In the present study, response to hydroquinone with sunscreens was Grade I improvement in 40% patients, Grade II improvement in 23.3% patients, Grade III improvement in 20% patients and Grade IV improvement in 16.7% patients.

Hurley *et al* [7] in 2002 noticed in their study of 18 physicians slight improvement in 14, 2%, moderate improvement in 57.1%, obvious improvement in 28% and very marked improvement in 0.

Hurley *et al* [7] in 2002 noticed in their study of 4 patients, slight improvement in 0, moderate improvement in 50% obvious improvement in 50% and very marked improvement in 0.

Balina and Graupe [8] in 1991 in their study of 165 women reported improvement by 3 levels in 8.2% patients, by 2 levels in 40.5% patients by 1 level in 40.5% patients and by < 0 levels in 10.8% patients.

Goh and Dlova [9] in 1999 reported in their study of 205 patients reported reduction of pigmentation of > 25% in 28% patients and > 75% reduction in 7% patients and in

40% the pigmentation remained stable.

Lim [10] in 1999 in his study of 40 Chinese women showed improvement in all patients and more than half of the melasma cleared in 47.5% patients.

Sanchez and Vazquez [11] 15 in 1995 reported overall improvement of 88% with hydroquinone and moderate to marked improvement in 36% patients.

Lim *et al* [12], in 1997 in their study of 10 Asian women reported improvement of melasma with a cream containing 1 0% glycolic acid and 2% hydroquinone.

Amer and Metwalli *et al* [13] in 1998 reported in their study of 50 patients reported good to excellent responses in 89.5%.

In the present study also, like in most of the above mentioned studies in most of the patients there was mild to moderate degree of improvement in majority of the patients. In the present study response was Grade I in 33.3% patients, Grade II improvement 33.3% patients, Grade III improvement in 16.7% patients and Grade IV improvement in 16.7%-patients.

Balina and Graupe [8] in 1991 reported in their study of 164 patients showed improvement by 3 levels in 5% patients, by 2 levels in 31.6% patients, by 1 level in 47.5% patients and by < 0 levels in 15.9% patients.

As mentioned in the various studies response to azelaic acid is variable in different groups.

In the present study Grade I improvement was seen in 30% Grade II improvement in 26.7%, Grade III improvement in 26.7% patients, Grade IV improvement in 16.7% patients.

Taylor *et al* [14], in 2002 in their study of 124 patients with moderately severe melasma 29% experienced clearing at 8 weeks, 51% had only mild melasma. 15% did not show any change from baseline.

Taylor *et al* [14], in 2002 in their study of 37 patients with severe melasma at baseline 16% demonstrated clearing, 51% had only mild melasma. 24% had moderate disease and 5% no evidence of change.

Guevara and Pandya [15] in 2001 in their study of 6 patients

reported Grade I improvement in 16.7%, Grade II in 33.3% and Grade III in 50%.

Thus the results of the present study are variable when compared to the above studies.

### Conclusion

The best response to treatment was seen with patients who underwent chemical peeling with TCA following pre peeling with retinoic acid and hydroquinone and strict usage of sunscreen.

The group of patients who received treatment with a topical combination of hydroquinone, retinoic acid and fluorinated steroid at night with sunscreen application in the morning for a period of 3 months showed considerable improvement. Compared to the above two regimens, the response to topical hydroquinone (4%) and azelaic acid was lower.

### References

1. Grimes PE. "Melasma: Etiologic and therapeutic considerations". *Arch Dermatol* 1995;131:1453-7.
2. Newcomer VD *et al.* "A melanosia of the face ('Cloasma)". *Arch Dermatol*, 1961;83:284-297.
3. Resnik S. "Melasma induced by oral contraceptive drugs". *J Am Med Assoc.* 1967;199:601-5.
4. Dawn G *et al.*, "Unilateral melasma". *Ind J Dermatol Venereol Leprol*, 1994;60:372-3.
5. Gupta AK, Gover MD, Nouri K, Taylor S. In "The treatment of Melasma A review of clinical trials. *J Am Acad Dermatol* 2006;55(6):10.
6. Kalla G *et al.* "Chemical peeling: Glycolic acid versus trichloroacetic acid in melasma". *Ind J Dermatol Venereol Leprol*, 2001;67:82-
7. Hurley ME *et al.* "Efficacy of glycolic acid peels in the treatment of melasma". *Arch Dermatol.* 2002;138:1578-1582.
8. Balina LM, Graupe K. "The treatment of melasma: 20% azelaic acid versus 4% hydroquinone cream". *Int J Dermatol.* 1991;12:893-895.
9. Goh CL, Dlova CN. "A retrospective study on the clinical presentation and treatment outcome of melasma in a tertiary dermatologic referral centre in singapore". *Singapore Med J*, 1999;40(7):455-8.
10. Lim JT. "Treatment of melasma using Kojic acid in a gel containing hydroquinone and glycolic acid". *Dermatol Surg.* 1999;25(4):282-4.
11. Sanchez JL, Vazquez M. "The efficacy of a broad spectrum sunscreen in the treatment of melasma". *Cutis.* 1983;32(1):95-96.
12. Lim JT *et al.*, "Glycolic acid in the treatment of melasma among Asian women". *Dermatol Surg.* 1997;23(3):177-179.
13. Amer M, Metwalli M. "Topical hydroquinone in the treatment of some hyperpigmentary disorders". *Int J Dermatol*, 1998;37:449-450.
14. Taylor S, Torok H, Jones T *et al.* "Efficacy and safety of a triple combination agent for the treatment of facial melasma". *Book of abstracts, World congress of Dermatologic July 2002*,107.
15. Guevara IL, Pandya AG. "Melasma treated with hydroquinone, tretinoin and a fluorinated steroid". *Int J Dermatol*, 2001;40(3):212-5.