

Original Article

Comparison between efficacy of serial glycolic acid peel and triple combination cream vs. triple combination cream alone in treatment of melasma

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Abstract *Background* Melasma is a common disorder of facial hyperpigmentation among Asian women. Many modalities of treatment are available but none is satisfactory.

Objective To determine if serial glycolic acid peels provide additional improvement when combined with a time-tested triple combination cream (0.05% tretinoin, 4.0% hydroquinone, and 0.01% fluocinolone acetonide).

Patients and methods Eighty melasma patients were divided into two groups of 40 each. One group received serial glycolic acid peels combined with a topical triple combination cream. The other, a control group, received only triple combination cream. The results were evaluated both subjectively (decrease in size and pigmentation) and with photographs taken at baseline, 4, 8 and 12 weeks (2 weeks after the sixth peel).

Results A significant improvement from baseline to 12 weeks was observed in both groups ($P < 0.001$). The group receiving the glycolic acid peels showed a trend toward more rapid and greater improvement, with statistically significant results ($p < 0.001$). Only a few side effects were observed in the peel group.

Conclusion This study demonstrates that serial glycolic acid peels provide an additional effect to a topical regimen for treating melasma if used judiciously and under supervision.

Key words

Glycolic acid, triple combination cream, melasma, hyperpigmentation.

Introduction

Melasma is a pigmentary disorder of face involving the cheeks, forehead, and the upper lip. It is especially seen in those living in areas of

intense UV radiation.¹ The exact etiology of melasma is unknown, however there are many contributing factors,² high estrogen states (pregnancy, oral contraceptives),³ genetic factors³ and cosmetics.⁴ The treatment of melasma remains a therapeutic challenge, because of its tendency to relapse, and due to its dermal component which is very difficult to treat,⁵ and is a source of considerable embarrassment and emotional distress in patients who are affected.^{6,7}

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The management of melasma includes broad spectrum sunscreen in combination with lightening agents, among these most popular is hydroquinone.⁸ Other lightening agents include retinoic acid, azelaic acid, kojic acid and flavonoid extract.⁹ Combination therapies such as hydroquinone, tretinoin, and steroids are considered to be more effective than monotherapy, a stable, once-daily formulation triple combination cream containing 0.05% tretinoin, 4.0% hydroquinone, and 0.01% fluocinolone acetonide represents the only commercially available combination of all three agents. This product is approved by the US FDA for the treatment of facial melasma. A number of publications have described the safety and efficacy of triple combination cream in over 2000 patients with melasma, some of whom were treated for >12 months.¹⁰

This study was conducted to evaluate whether serial glycolic acid 50% peels in combination with time tested triple combination cream provide any additional benefit.

Patients and methods

Eighty patients of melasma attending the outdoor skin department of Multan Medical and Dental College, Multan from December 2008 to December 2009 in 20-45 years age groups were recruited in study.

Complete history and examination of all the patients with regard to onset of melasma, total duration and aggravating factors was documented. Pattern of melasma, (centrofacial, mandibular, and malar), Fitzpatrick skin type, type of melasma (dermal, epidermal, mixed) on wood's lamp was noted. Pregnant and lactating women and patients with active infection e.g. herpes labialis, bacterial, patients with dermal and mixed melasma and those who conducted

the therapy during previous 3 months were excluded from study.

Patients were randomly divided into 2 groups, group A and group B (control group). Both groups received nightly application of triple combination cream. In addition only group A patients were treated with serial glycolic acid 50% peels. Full face peel was done at 2 week interval and total 6 peels were done. The face was first treated with mild cleanser and water. Glycolic acid 50% was applied with soft fan like brush. The peeling solution was neutralized with water after development of slight erythema.

All patients in both groups were advised to use sun block (SPF 30) during day and patients in group A were also advised to avoid sunlight following peel for next few days.

Response was assessed by 2 criteria, photographs and clinical response assessed by doctor at 4-weekly intervals. The reduction in the area of melasma and degree of lightening was noted. Improvement was graded as, 0-25%, 25-50%, 50-75%, more than 75%, and clear and given scores of 1, 2, 3, 4, and 5, respectively.

Results

Age of patients ranged from 22-44 years with mean age 33.3 ± 8.6 years in group A and 23-45 years with mean age 36.3 ± 7.6 years in group B. All the patients had a malar melasma with only 3 (3.7%) having a melasma on forehead, chin and upper lip in group A. 53 (66%) patients had skin type III, and 37 (46%) patients skin type IV. They had melasma for 2-10 years, majority for 5 years. Family history of melasma was present in 21 (52.5%) patients in group A and 18 (45%) patients in group B. Sunlight was aggravating factor in all the patients. Other aggravating factors were pregnancy in 40 (50%) patients and

Table 1 Improvement in melasma accessed by decrease in size and pigmentation in group A and B

Improvement	Group A (N = 40)			Group B (N = 40)		
	4 week N (%)	8week N (%)	12 week N (%)	4 week N (%)	8 week N (%)	12 week N (%)
No	0 (0%)	0 (0%)	0 (0%)	4 (10%)	0 (0%)	0 (0%)
25%	4 (10%)	3 (7.5%)	1 (2.5%)	2 (5%)	6 (15%)	4 (10%)
25-50%	16 (40%)	11 (27.5%)	2 (5%)	16 (40%)	12 (30%)	6 (15%)
50-75%	18 (45%)	16 (40%)	11 (27.5%)	18 (45%)	14 (35%)	12 (30%)
75-99%	2 (5%)	10 (25%)	22 (55%)	0 (0%)	8 (20%)	18 (45%)
Clear	0 (0%)	0 (0%)	4 (10%)	0 (0%)	0 (0%)	0 (0%)

Table 2 Patients showing more than 50% improvement in melasma at end of study (12 weeks).

Improvement in melasma	Group A	Group B
More than 50%	37 (92.5%)	30 (75%)
Less than 50%	3 (7.5%)	10 (25%)

Table 3 Photographic improvement in melasma at 12 weeks.

Improvement in melasma	Group A	Group B
Improved	37 (92.5%)	31 (77.5%)
Not improved	3 (7.5%)	9 (22.5%)

oral contraceptives in 14 (17.5%) patients.

At the end of study all the patients showed improvement whether peel was done or not. Treatment response in group A and B is shown in **Table 1**. **Table 2** shows the percentages of patients showing more than 50% and less than 50% improvement at the end of study. Improvement in photographic appearance is shown in **Table 3**.

At 4 weeks response was almost similar in both groups, as shown in table. More than 50% improvement was seen in 20 (50%) patients in group A and 18 (45%) patients in group B. While 4 (10%) patients showed no response in group B at 4 week. Overall efficacy showed that in group A at the end of study 4 (10%) patients showed complete clearance of melasma, 22 (45%) patients showed more than 50% improvement, 11 (27.5%) patients showed 50-75% improvement with only 3 (7.5%), patients showing less than 50% improvement. In group B, 18 (45%) patients showed more than 50% improvement, and 12 (30%) patients showed 50-

75% improvement and 10 (25%) patients showed less than 50% improvement. There was no patient with complete clearance of melasma in group B ($p < 0.001$).

Side effects observed in group A during the chemical peeling were mild, including erythema in 15 (37.5%) patients, scaling in 2 (5%) patients and postinflammatory hyperpigmentation in 1 (2.5%) patient which resolved with application of triple combination cream. Triple combination cream was well tolerated by patients in both groups and no side effects were noted.

Discussion

Chemical peeling has been used since long time to smoothen and improve the skin texture. Unna, a German dermatologist first reported in 1882 the use of salicylic acid, resorcinol, phenol, and trichloroacetic acid for chemical peeling. Since then a number of agents are being used, most fruitful among these are alpha hydroxy acids. These have been shown to improve photodamaged skin and fine wrinkles. Glycolic acid, an alpha hydroxy acid, is the most commonly used, versatile agent.

Glycolic acid peeling is being used alone or in combination with depigmenting agents in the treatment of melasma. It works not only by peeling off the pigment but also by increasing the depth of penetration of topical therapy.

This study compared the efficacy of glycolic acid peels in combination with triple combination cream vs. triple combination cream alone. In this study sunlight exposure was most common aggravating factor in most patients. Javaheri *et al.*¹² observed a similar finding in etiology of melasma. Study results showed glycolic acid peel in combination with triple combination cream was more effective in clearing pigment of melasma as compared with triple combination cream alone. At the end of study 4 patients (10%) in group A showed complete clearance while complete clearance was not observed in group B, 22 (55%) patients had more than 75% improvement in group A as compared to 18 (45%) in group B. Less than 25% improvement was seen in only 1 (2.5%) patient in group A vs. 4 (10%) patients in group B ($p<0.001$).

Similar additive effect of glycolic acid peel was found in Sarkar *et al.*¹¹ study of 40 patients, 20 in each group who found a significant decrease in MASI from baseline to 21 weeks in both groups ($p<0.001$). However, the group receiving glycolic acid peel and modified Kligman formula showed a trend towards more rapid and greater improvement than group receiving only modified Kligman formula ($p<0.001$).

Javaheri *et al.*¹² in their 3 months study with 50% glycolic acid peel experienced improvement in melasma in 91% of patients ($p<0.01$).

Lim and Tham¹³ found that cream containing 20% glycolic acid and 2% hydroquinone improved melasma and fine wrinkling in Asian women. However, melasma lightening effect of glycolic acid peel at 3-week interval was subjectively much better.

Side effect observed with glycolic acid peel were mild erythema in 15 patients (37.5%),

scaling in 2 (5%), and postinflammatory hyperpigmentation in 1 (2.5%) patient and was well tolerated by all the patients. This is in accordance with Sarkar *et al.*¹⁴ 1-year study showing that chemical peeling with glycolic acid is safe and effective treatment modality for treatment of melasma in our population, showing a significant reduction in melasma area severity index (MASI) 75% ($p<0.05$).

Beneficial effect of adding glycolic acid peel to topical therapy was also observed in Erbil *et al.*¹⁵ 20 weeks study showing a prominent decrease in MASI in both groups although results were better in group receiving glycolic acid peel along with topical azelaic acid cream and adapalene gel ($p<0.048$).

Grover and Reddu¹⁶ investigated role of topical glycolic acid in a concentration of 10-30% for 3-5 minutes at fortnightly intervals as therapeutic peeling agent in 41 patients having acne (39%), melasma (36.5%), postinflammatory hyperpigmentation (12%) and superficial scarring of varied etiology (12%). A final evaluation done at 16 weeks revealed that this modality is useful especially in superficial scarring and melasma, moderately successful in acne patients with no response in dermal pigmentation. No significant untoward effects were seen.

It is concluded that glycolic acid peel is beneficial in increasing the melasma clearing effect of triple combination cream. It is safe and well tolerated with fewer side effects. Furthermore, patient feels more satisfied with peel because most of them had already used a lot of topical creams for this frustrating condition and peel gave them satisfaction that something new is being done for their melasma, and because peel gave them feeling of smoothness and radiant glow.

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