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Original Article

Efficacy and Safety of 50% glycolic acid peels in the treatment of melasma in Fitzpatrick's skin type IV and V

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Abstract

ObjectiveTo determine the efficacy and safety of 50% glycolic acid peels in melasma in Fitzpatrick's skin type IV and V.

Methods50 patients of melasma were included in the study. Type of melasma was identified with the help of Wood's lamp. Patients were advised a pre-peel program of daily application of tretinoin 0.05% at bedtime for 2-weeks. MASI scoring and colored photographs of each patient were taken before each peel with 50% glycolic acid and at the end of follow-up. Treatment was carried out with an interval of 2-weeks for a total of 6 sessions. Efficacy was assessed 4 weeks after the last session. Side effects, if any, were also recorded.

ResultsThe mean age of the patients was 28.88 ± 6.02 years. There were 44 (88%) females and 6 (12%) male patients. 20 (40%) patients had epidermal melasma, 28 (56%) had mixed type and only 2 (4%) patients presented with dermal melasma. Mean baseline MASI score was 15.54 ± 5.76 and the mean MASI score at the end of treatment was 9.6 ± 4.8. The mean percentage of reduction of MASI score was 40.57 ± 11.9%. A significant improvement from baseline to 14 weeks was observed. Only a few side effects were seen in the form of mild erythema and burning sensation.

ConclusionThis study demonstrates that serial glycolic acid peels are effective and safe in the treatment of melasma in Fitzpatrick's skin type IV and V.

Keywords
Melasma, chemical peeling, glycolic acid.

Introduction

Melasma is a melanogenesis dysfunction that results in localized, chronic, acquired hypermelanosis of the skin. It occurs symmetrically on sun-exposed areas of the body, especially on the face and is more common in females, particularly of reproduction age.[1] It mainly affects darker skin types, such as Hispanics, Latinos, Asians, African-Americans.[2]

The exact cause of melasma is unknown. The most commonly identifiable risk factors include ultraviolet radiation, genetic predisposition, pregnancy, oral contraceptives, thyroid disease, cosmetics, nutrition and drugs.[3] Despite tremendous research in the etiopathogenesis, the treatment of melasma remains a therapeutic challenge to dermatologists. It has a deleterious impact on a patient's quality of life.[2]

The management of melasma includes the use of broad spectrum sunscreen in combination with depigmenting agents, such as hydroquinone, retinoic acid, azelaic acid, kojic acid, flavonoid

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extracts, fish oil, green tea, deoxyarbutin and liquiritin. Chemical peels are often added in second line therapy. Laser and light therapies represent potentially promising option for patients who are refractory to other modalities.[3]

Chemical peels cause controlled exfoliation, followed by regeneration of epidermis and dermis. Superficial and medium-depth peels have been employed with variable success in the treatment of melasma.[4] Because of the risk of prolonged dyschromia, medium-depth and deep peels should be avoided in patients with dark skin.[5]

Glycolic acid peel, also known as fruit peel is the most common alpha-hydroxy acid peel. It is simple, inexpensive and has no down time. Depth of the glycolic acid peel depends on the concentration of the acid used and the time for which it is applied. It is classified as: very superficial (30%-50% GA applied for 1-2 minutes), superficial (50-70% GA applied for 2-5 minutes) and medium-depth (70% GA, applied for 3-15 minutes).[6] Glycolic acid peels have anti-inflammatory, keratolytic and anti-oxidant effects. It targets the corneosome by enhancing breakdown and decreasing cohesiveness, causing desquamation.[7]

In the present study, we aimed to determine the efficacy and safety of 50% GA peels in melasma in Fitzpatrick's skin type IV and V.

Methods

This interventional study was approved by the Ethical Committee of KEMU/Mayo Hospital, Lahore. 50 patients of melasma of any type (epidermal, dermal, mixed), attending the outpatient skin department of Mayo Hospital, Lahore, having Fitzpatrick's skin type IV and V were enrolled in the study, after informed consent. Pregnant and lactating women, patients with active infection, having keloidal tendencies, photosensitive dermatoses and those taking drugs known to cause facial hypermelanosis were excluded from the study. Complete history and examination of the patients were documented. Type of melasma was noted using Wood's lamp.

Patients were advised to use tretinoin 0.05% cream at night for two weeks (stopped 1 week before the procedure) as pre-peel priming. Baseline melasma area and severity index (MASI) scoring was done. Before each session, patients were advised to wash the area with bland soap and water. 35% GA was applied at first session and then 50% GA concentration was used in the remaining sessions, carried out at 2 weeks interval. Total 6 sessions were done. The peeling solution was neutralized with water after development of mild erythema. MASI scoring and photographs were taken before each peel and 4 weeks after the last session. Efficacy was assessed 4 weeks after the last session. A 4-grade scale was use to assess the efficacy (poor= <25% improvement; fair= 25-49% improvement; good= 50-75% improvement; and excellent= >75% improvement). The degree of tolerability to the peel and side effects, if any, were recorded.

Results

The age of patients ranged from 18-44 years with mean age of 28.88 ± 6.02 years. The maximum numbers of patients were in age group 26-30 (36%).Out of the 50 cases, 44 (88%) were females and 6 (12%) were males.The mean duration of melasma was 3.36 ± 1.59 years, majority (45, 90% patients) had it for 5 years. 26 (52%) patients were housewives and the rest were students, shopkeeper, computer assistants, beauticians, teacher, stenotypist and salesman.

Table 1 Stratification of efficacy with type of melasma (n=50).

Type of melasma	*Efficacy*				*Total*
	Excellent (>75% improvement)	*Good (50-75% improvement)*	*Fair (25-49% improvement*	*Poor (<25% improvement)*	
Dermal	0	0	0	2	2
Epidermal	0	8	10	2	20
Mixed	0	7	16	5	28
Total	0	15	26	9	50

Table 2 Stratification of efficacy with Fitzpatrick's skin type (n=50)

Fitzpatrick's skin type	*Efficacy*				*Total*
	Excellent (>75% improvement)	*Good (50-75% improvement)*	*Fair (25-49% improvement*	*Poor (<25% improvement)*	
IV	0	15	21	3	39
V	0	0	5	6	11
Total	0	15	26	9	50

Table 3 Stratification of efficacy with duration of melasma (n=50).

Duration (years)	*Efficacy*				*Total*
	Excellent (>75% improvement)	*Good (50-75% improvement)*	*Fair (25-49% improvement*	*Poor (<25% improvement)*	
1-5	0	14	23	8	45
6-10	0	1	3	1	5
Total	0	15	26	9	50

39 (78%) patients had type IV skin and 11 (22%) were with type V skin. 28 (56%) patients had mixed type of melasma, 20 (40%) patients presented with epidermal and only 2 (4%) had dermal melasma.

The mean baseline MASI score was 15.54 ± 5.76, with majority of patients (60%) in MASI score range of 11-20.The mean MASI score at the end of treatment was 9.6 ± 4.8, with majority of patients (68%) in MASI score range of 1-10, having mean MASI of 7.23 ± 2.21.

In this study, the mean of percentage reduction of MASI score was 40.57 ± 11.9%, with majority of patients (36%) showing the mean MASI score reduction of 45.31 ± 2.36%.

26 (52%) patients showed fair response (25-49% reduction in MASI score), 15 (30%) patients were recorded with good response i.e. 50-75% reduction in MASI score at the end of 14 weeks and only 9 (18%) patients came out with poor response (<25%). None of the cases showed an excellent response (>75% reduction in MASI score).

The stratification of efficacy with type of melasma, skin type and duration of melasma is shown in **Table 1**, **2** and**3**, respectively.

Regarding tolerability and safety of glycolic acid peeling, all (100%) patients showed mild erythema and burning sensation and only 4 (8%) patients showed mild blistering and crusting. 2 (4%) patients showed postinflammatory hyperpigmentation, both were of type V skin with dermal melasma.

Discussion

Melasma is a common acquired disorder of hyperpigmentation having severe impact on quality of life, causing deep psychological and social stress.[8] Glycolic acid peeling is being used since long, either alone or in combination with depigmenting agents for the treatment of melasma.

In the present study, the mean age of patients was 28.88 ± 6.02 years and the maximum number of patients (36%) were in age group 26-30 which is in concordance with the studies by Godse *et al.*[9] and Puri *et al.*[10] having mean age of 30.02 and 29.72 years, respectively.

In our study, 44 (88%) patients were females and 6 (12%) were males, which is in concordance with study by Puri *et al.*[10] showing female predominance with 82% patients.

In our study, mean duration of melasma was 3.36 ± 1.59 years and majority for 5 years. This is comparable with studies by Dogra *et al.*,[11] Puri *et al.*[10] and Erbil *et al.*[12] in which the mean duration was 3.92 ± 2.55, 4.00 ± 2.57 and 3.78 ± 1.59 years, respectively.

The reduction in MASI score after each peel was compared with the pre-peel scores and it showed a constant decrease in MASI score after the peeling sessions. The mean baseline MASI score was 15.54 ± 5.76 and the mean of MASI score at the end of treatment i.e. 4 weeks after the last session was 9.6 ± 4.8. This is comparable with study by Dogra *et al.*[11] showing mean baseline MASI score of 13.20 ± 3.45 and mean MASI score of 9.16 ± 3.45at the end. In studies by Godse *et al.*[9] and Erbil *et al.*,[12] the mean MASI score significantly decreased from 19.72 ± 6.71 to 10.17 and from 18.67 to 11.30, respectively. Godse *et al*.[9] used triple combination of tretinoin 0.05%, hydroquinone 4% and mometasone furoate 0.1% along with the serial GA peels. Similarly Erbil *et al*.[12] used serial GA peels from 35% to 70% along with topical application of azelaic acid. This difference in results may be because glycolic acid works not only by peeling off the melanin pigment but also by increasing the depth of penetration of topical therapy which would further suppress the appearance of melasma.[4] Similar results were found in study by Chaudhary *et al*.[13], using serial GA peels with triple combination cream.

In our study, the mean percentage reduction in MASI score was 40.57 ± 11.9% which is comparable with study by Dogra *et al*.[11] Godse *et al.*[9] and Erbil *et al.*[12] showed better percentage reduction in MASI score. Erbil*et al.*[12] used higher concentration of GA peel (along with topical azelaic acid) which could be a reason for the difference in results. Increasing the GA concentration will increase the depth of penetration resulting in more pigment clearance but we need to be extra cautious while using medium depth peels in patients with Fitzpatirck's skin type IV and V, because of the risk of postinflammatory hyperpigmentation.[3,4,14]

In present study, out of 50 cases, 15 (30%) patients showed good efficacy i.e. 50-75% reduction in MASI score at the end of last session and 26 (52%) patient had fair efficacy i.e. 25-49% reduction in MASI score.

The overall therapeutic response, with regards to percentage reduction in MASI score and efficacy, showed that more than 80% patients reported fair to good response and only 9 (18%) cases presented with poor efficacy i.e. <25% reduction in MASI score. This is in contrast with the study by Dogra *et al.*[11] in which 88% patients showed poor to fair efficacy and only 12% showed good response. The difference in results could be because Dogra *et al*.[11] used 50% GA peels for 3 sessions only, at 3 weeks interval, while in our study serial 50% GA peels were applied for 6 sessions at 2 weeks interval along with pre-peel priming. Increasing the number of peeling sessions lead to more pigment clearance.

In our study, the side effects observed with GA peel were mild erythema and burning sensation in all patients, which was transient, relieving within 1-3 hours with moisturizer and sunblock

application. 8% patients reported with mild blistering and crusting which cleared in 5-10 days after application of topical antibiotic. 2 (4%) patients developed blistering followed by post inflammatory hyperpigmentation after 4 sessions. Peeling was discontinued and 1% hydrocortisone cream and sunblock was advised and pigmentation subsided within 4-6 weeks.

The stratification of efficacy with Fitzpatrick's skin type showed that 36 out of 50 cases of type IV skin exhibited fair to good response while only 5 patients of type V skin reported with fair efficacy. Similarly 41 patients having epidermal and mixed melasma showed fair to good efficacy and both patients of dermal melasma reported with poor response.

Conclusion

It is concluded that serial 50% GA peeling is effective in the treatment of melasma in patients with Fitzpatrick's skin type IV and V. It is safe and well-tolerated with very few side effects. GA peeling is more effective in patients with epidermal and mixed melasma having type IV skin as compared to patients with dermal melasma and type V skin. Increasing the number of peeling sessions may result in more effective clearance of melanin pigment. Priming or preparing the skin prior to the peel is a useful adjunctive measure which not only enhances the effect of peeling but also decreases the risk of post inflammatory hyperpigmentation. Although the treatment of melasma in dark skin is frustrating and challenging, cautions and judicious use of GA peeling and combining it with other treatment modalities may give better cosmetic outcome.

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