

Efficacy of topical 4% liquiritin compared with topical 4% liquiritin mixed in 5% ascorbic acid in the treatment of melasma

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Abstract *Objective* To compare the efficacy of topical 4% liquiritin alone with combination of topical 4% liquiritin and topical 5% ascorbic acid for the treatment of melasma.

Patients and methods This randomized control study was carried out in the Outpatient, Department of Dermatology, Nishtar Hospital, Multan. The duration of the study was six months. Eighty two patients with epidermal melasma belonging to either sex and 16-45 years of age, were divided into two equal groups. Group A was given topical 4% liquiritin and group B was given topical 4% liquiritin mixed with 5% ascorbic acid. Patients were followed up after 8 weeks of treatment to find out the efficacy of both the treatments.

Results In group A, 25 (61%) patients showed improvement in MASI score and 16 (39%) had no improvement in MASI score. In group B, 36 (87.8%) patients showed improvement in MASI score and 5 (12.2%) were without improvement in MASI score. The observed difference of MASI score improvement between group A and group B was 26.8% ($p < 0.05$).

Conclusion Topical 4% liquiritin mixed in 5% ascorbic acid is more effective than topical 4% liquiritin alone in the treatment of melasma.

Key words

Melasma, efficacy, liquiritin, 5% ascorbic acid, MASI score.

Introduction

Melasma is a common acquired symmetrical hypermelanosis characterized by irregular light-brown to grey-brown macules and patches on sun-exposed areas of skin.¹ Hypermelanosis affects the upper lip, cheeks, forehead and chin and becomes more apparent following sun exposure. The areas are brown in colour and are bilateral and frequently symmetrical.² The precise cause of melasma remains unknown; however, there are many possible contributing factors.³ Sunlight, natural and synthetic estrogen and progesterone hormones have been incriminated in pathogenesis due to the

association of the disease with pregnancy, oral contraceptives and ovarian tumor. Genetic factors, thyroid dysfunction, cosmetics, phototoxic and antiseizure drugs have been implicated as other etiological factors. 0.25-4% of patients seen in South East Asian clinics come with melasma. Melasma is seen mainly in women but up to 10% of cases are seen in men also.

Melasma can be both dermal and epidermal. Dermal melasma is resistant to treatment and has tendency to relapse.⁴ As melasma is one of the commonest aesthetically displeasing entity, its proper treatment and cure is mandatory. The mainstay of treatment remains topical depigmenting agents especially hydroquinone. Other lightening agents used are retinoic acid (tretinoin), azelaic acid, kojic acid, isopropylcatechol, N-acetyl-4cysteaminyl-

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phenol, and certain natural extracts like arbutin, aloesin, flavonoids, hesperidin, soy and many others are being investigated for their ability to produce hypopigmentation. Superficial and medium depth chemical peels have become an effective procedure in management of melasma.⁶

Laser treatments and intense pulsed light therapy are additional therapeutic modalities that have been used to treat melasma.⁷

Liquiritin is an extract from root of glycyrrhiza. It's being used from centuries in traditional herbal medicines. Its main ingredient is glabridin which is an effective tyrosinase inhibitor and can act as bleaching agent. It has been used in many skin lightening cosmetics. As being natural, cheap and devoid of side effects it deserves to be tried for efficacy in treatment of melasma.⁸

Ascorbic acid has antioxidant properties and affects melanogenesis by reducing dopaquinone to DOPA and preventing free-radical production and absorption of ultraviolet radiation.^{9,10}

Mostly used topical preparations have ascorbic acid in 0.3-10% concentrations but 15% and 20% concentrations can also be used. Topical ascorbic acid cream is a safe and effective alternative to conventional treatments. In a study comparing efficacy of 4% hydroquinone vs. 5% ascorbic acid in melasma it was concluded that 68.7% patients using 4% hydroquinone developed side effects as compared to only 6.2% patients using 5% ascorbic acid. So 5% ascorbic acid is better tolerated and may therefore be considered as first line therapy for patients wishing to try the safest treatment first.¹¹ Different combination therapies have opened broad vistas in the treatment of melasma. Ascorbic acid can be used as an additive to increase penetration and enhance efficacy of the other modality.¹²

To compare the efficacy of topical 4% liquiritin alone vs. topical 4% liquiritin mixed in 5%

ascorbic acid for the management of melasma in patients presenting to tertiary care centre.

Patients and methods

This randomized control study was carried out in the Outpatient Department of Dermatology, Nishtar Hospital, Multan. Duration of study was six months. The disease was diagnosed on the basis of clinical features and appearance on Wood's lamp examination. Eighty two patients with epidermal melasma of either sex, age between 16 to 45 years and having no other skin disease were enrolled. The patients having pregnancy-induced melasma, known hypertension, allergy to liquiritin or ascorbic acid and currently receiving hormone replacement therapy were excluded from study. After briefing the merits and demerits of both the treatments with the patient, a formal informed consent was taken.

Patients were divided randomly into two groups on computer generated randomization list. Forty one patients treated with topical 4% liquiritin alone were included in group A while another 41 patients treated with topical 4% liquiritin mixed with 5% ascorbic acid were included in group B. Patients were given all necessary instructions about application and use of sunblock during the day period.

Patients were followed up after 8 weeks of treatment to find out the efficacy of both the treatments. All the data were recorded in a pro forma specifically designed for the study.

Evaluation

Efficacy of both the treatments was assessed by calculating pre and post treatment melasma area severity index (MASI) score⁸ as follows.

Percentage of the total area involved (A): 0%= no involvement; 1= <10%, 2=10-29%, 3= 30-49%, 4= 50-69% 5= 70-89%, 6= 90-100%

involvement. Darkness of the melasma (D): 0= normal skin color without evidence of hyperpigmentation; 1= barely visible hyperpigmentation; 2= mild hyperpigmentation; 3= moderate hyperpigmentation; 4= severe hyperpigmentation.

Homogeneity of the hyperpigmentation (H): 0= normal skin color without evidence of hyperpigmentation; 1= specks of involvement; 2= small patchy areas of involvement <1.5 cm diameter; 3= patches of involvement >2 cm diameter; 4= uniform skin involvement without any clear areas).

To calculate the MASI score, the sum of the severity grade for darkness (D) and homogeneity (H) is multiplied by the numerical value of the areas (A) involved and by the percentages of the four facial areas (10-30%). Total MASI score: Forehead 0.3 (D+H)A + right malar 0.3 (D+H)A + left malar 0.3 (D+H)A + chin 0.1 (D+H)A

Reduction of $\geq 50\%$ in MASI score from that of pretreatment scoring was considered as effective.

Results

This study enrolled 82 patients of melasma between ages of 16 to 45 years. Gender distribution was 8 (10%) males and 74 (90%) were females. In group A, male patients were 3(7%) and female patients were 38(93%). In group B male patients were 5 (12%) and female were 36 (88%), [Figure 1]. Duration of melasma was from 2 months to 10 years.

In group A, 25 (61%) patients showed improvement in MASI score and 16 (39%) did not show improvement. In group B 36 (88%) patients showed improvement in MASI score and 5 (12%) did not show improvement as shown in Table 1.

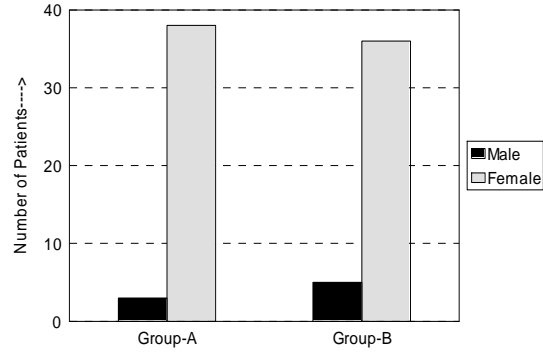


Figure 1 Gender distribution in two groups.

Table 1 Comparison of groups A and B in the improvement of MASI score in melasma treatment.

	Group A (N=41)	Group B (n=41)
No. of patients showing MASI score improved	25 (61%)	36 (87.8%)
No. of patients showing MASI score not improved	16	05

The observed difference of MASI score improvement between group A and group B is 26.8% ($X^2=5.5, p=0.05$).

Discussion

In our study the efficacy of topical 4% liquiritin alone in the management of melasma was compared with 4% liquiritin mixed in 5% ascorbic acid and it was observed that topical 4% liquiritin mixed in 5% ascorbic acid is more effective than topical 4% liquiritin alone in the treatment of melasma.

Forty one patients were treated with topical liquiritin alone and it was observed that 25 (61%) patients showed improvement in MASI score and 16 (39%) did not show improvement in MASI score.

Another group of 41 patients were treated topical 4% liquiritin mixed in 5% ascorbic acid and it was observed that 36 (87.8%) patients showed improvement in MASI score and 5

(12.2%) did not show improvement in MASI score.

In a study comparing efficacy of 5% ascorbic acid and 4% hydroquinone in 16 patients with melasma in a double-blind clinical trial,¹¹ the authors concluded that although hydroquinone showed a better response but 68.7% patients using 4% hydroquinone develop side effects as compared to only 6.2% patients using 5% ascorbic acid. So 5% ascorbic acid is better tolerated and is almost devoid of side effects and may therefore be considered as first line therapy for patients wishing to try the safest treatment first.

Vitamin C can be combined with other melasma treatments for enhanced results. It can fade melasma from a dark black to light tan while also providing additional protection from the sun. In one study, 55% of the cases showed improvement after 5 months on a 10% formulation of vitamin C.¹²

A study was conducted to compare the efficacy of 20% trichloroacetic acid peel alone vs. 20% trichloroacetic acid peel combined with topical 5% ascorbic acid in epidermal melasma.¹³ The study showed that 87% of patients using 20% trichloroacetic acid peel combined with topical 5% ascorbic acid improved and maintained their improvement as compared to only 67% patients using 20% trichloroacetic acid peel alone.

Melasma is seen mainly in women but up to 10% of cases are seen in men also.³ In our study also 74 (90%) patients were females and 8 (10%) patients were male.

Conclusion

Topical 4% liquiritin mixed in 5% ascorbic acid is more effective, safer and cosmetically

acceptable as compared to topical 4% liquiritin alone for treatment of melasma.

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