

A Study on the Efficacy of Mesotherapy using Glutathione and Vitamin C for the Treatment of Melasma

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Abstract

Introduction: The efficacy of glutathione in melasma is due to its skin-lightening effects which are direct as well as indirect inhibition of the tyrosinase enzyme and switching from eumelanin to pheomelanin production. It is available in oral, parenteral and topical forms. Although the use of intravenous glutathione injections is popular, there is no evidence to prove its efficacy.

Aims: To see the efficacy of mesotherapy using glutathione and vitamin C for the treatment of melasma.

Methods: We selected forty patients of melasma between the age group of 20 - 50 years for the study. Injection glutathione and vitamin C was given at each visit by point to point technique with a mesotherapy needle 26 having a length of 4 mm. The sessions were repeated every two weeks for the first two months and then every month for next two months, making a total of six sessions. Follow up was done for a period of six months after the last session. MASI score was calculated in all the patients before the treatment and then at each visit.

Results: After 12 weeks of treatment, percentage reduction in MASI score was 42.38% and it was 53.84% at 6 months. Physician Global Assessment improved significantly after 6 sessions. The commonest side effect after mesotherapy was pain seen in 10% patients, erythema seen in 5% patients. Oedema and multiple locules or abscesses were seen in 2.5% patients each.

Discussion: Although, glutathione is efficacious in melasma, further randomized, double blinded and placebo controlled studies with larger number of patients needs to be conducted to validate the efficacy of glutathione in mesotherapy for melasma.

Keywords: Glutathione; Melanin; Melasma; Mesotherapy; Tyrosinase

Introduction

Melasma is a common pigment disorder which causes significant emotional and psychosocial distress in patients. Multiple etiologic factors have been implicated like high estrogen states (pregnancy, oral contraceptives), genetic factors, cosmetics and autoimmune thyroid disease [1,2]. Sunlight exposure appears to be essential for its development. Melasma is often difficult to manage because of its refractory and recurrent nature [3]. There has been a recent hype in the use of mesotherapy for melasma. Many topical lightening agents have been tried for melasma but no single modality gives a long lasting effect. Very few studies have been done using glutathione in mesotherapy. Glutathione is essential in melasma by the ability to inhibit melanin synthesis.

Aims

To see the efficacy of mesotherapy using glutathione and vitamin C for the treatment of melasma.

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Methods

We selected forty patients of melasma between the age group of 20 - 50 years for the study. Prior permission of hospital ethical committee was taken for the study. Written informed consent was taken from all the patients before the study. Priming was done two weeks prior in all the patients using tretinoin 0.05% cream. MASI score was calculated in all the patients before the treatment and then at each visit. Injection glutathione and vitamin C was given at each visit by point to point technique with a mesotherapy needle 26 having a length of 4 mm (upto dermis). Both the drugs injected complemented each other and increased the overall efficacy of the procedure. The sessions were repeated every two weeks for the first two months and then every month for next two months, making a total of six sessions. Follow up was done for a period of six months after the last session. The patients were instructed to avoid physical activity for the first 48 hours. Pre-treatment photographs were taken and then at each visit. A patient's subjective assessment score was also done as follows:

>90% Response - Excellent response
 75% - 90% - Very good response
 50% - 74% - Good response
 25% - 49% - Average response
 <25% - Poor response

The following patients were included in our study

- All patients between age group of 20 - 50 years
- Patients with both epidermal and dermal type of melasma
- Patients with Fitzpatrick skin types II to V having moderate to severe melasma
- Patients with mental capacity to give informed consent

The following patients were excluded from our study:

- Participants with a history of hypertrophic scars or keloids
- Participants with recurrent herpes infection
- Presence of active dermatitis
- Patients with unrealistic expectations
- Patients with use of isotretinoin in past 6 months

Results

The results were collected; tabulated (Table I - V) and the results were analyzed statistically.

SR NO	AGE DISTRIBUTION	NUMBER	PERCENTAGE
1	20 - 30	14	35%
2	31 - 40	20	50%
3	41 - 50	6	15%
	TOTAL	40	100

Table I: Table showing age distribution of patients.

SR NO	SEX DISTRIBUTION	NUMBER	PERCENTAGE(%)
1	Females	36	90%
2	Males	4	10%
	Total	40	100

Table II: Table showing sex distribution of patients.

SR NO	PATTERN OF MELASMA	NUMBER	PERCENTAGE
1	CENTROFACIAL	6	15%
2	MALAR	16	40%
3	MIXED	18	45%
	TOTAL	40	100

Table III: Table showing pattern of melanosis.

SR NO	PARAMETERS	START	3 WEEKS	3 MONTHS	6 MONTHS
1	MASI	15.6± 3.8	10.5±1.7	7.2±4.3	7.2± 2.5
2	MEAN PGA	—	8.6± 4.2	4.3± 5.8	3.2± 2.7

Table IV: Table showing melasma parameters.

SR NO	SIDE EFFECTS	LASERS	GLYCOLIC ACID PEEL
1	PAIN	4	10%
2	ERYTHEMA	2	5%
3	OEDEMA	1	2.5%
4	MULTIPLE LOCULES OR ABSCESSSES	1	2.5%

Table V: Table showing side effects of peels.

Discussion

Regarding the age distribution of patients and it was seen that maximum (50%) patients were between 31 - 40 years, 35% patients were between 20-30 years and 15% patients were between 41-50 years of age (Table I) . Females outnumbered males and female: male ratio was 9:1(Table II). The pattern of melanosis was of malar type in 40% patients, mixed in 45% patients and centrofacial in 15% patients (Table III). It was seen that epidermal type of melasma was seen in 60%

patients, dermal was seen in 10% patients and mixed melasma was seen in 30% patients. Regarding the skin types, 34% patients had skin type IV, 32% patients had skin type III and 14% patients had skin type II. It was seen that the commonest cause of melasma in our study was after pregnancy in 35% patients, oral contraceptive use was associated with melasma in 26% patients and outdoor occupation was the cause of melasma in 39% patients. Subjective response as graded by the patient showed very good response in 70% patients (Figure 1a & 1b) and good response in 64% patients (Figure 2a & 2b).The commonest side effect after mesotherapy was pain seen in 10% patients, erythema seen in 5% patients. Oedema and multiple locules or abscesses were seen in 2.5% patients each (Table IV). After 12 weeks of treatment, percentage reduction in MASI score was 42.38% and it was 53.84% at 6 months (Table V). Physician Global Assessment improved significantly after 6 sessions. Mean treatment satisfaction scores were good after 12 weeks of treatment.



Figure 1a & 1b: Pre and post treatment photograph of 42 years old female after 6 sessions of mesotherapy.



Figure 2a & 2b: Pre and post treatment photograph of 44 years old female after 6 sessions of mesotherapy.

Side effects of mesotherapy in experienced hands is rare [4,5]. The main reasons for less frequent side effects is that very less dosage is given. If proper aseptic measures are not taken, then multiple locules or abscesses can occur. Also, redness scars and subcutaneous nodules can occur. In our study we applied the mesotherapy technique according to the recommendations of good clinical practice published to date [6].

Recently glutathione has come into focus in aesthetics because of its antimelanogenic properties. Glutathione causes lightening of the skin due to its effect on inhibition of tyrosinase enzyme. It is available in oral, topical and parenteral forms. Since both oral and intravenous forms have variable side effects, so glutathione has been tried as a meso-therapeutic agent. Also, since glutathione is an antioxidant, so the free radical scavenging effect of glutathione blocks the induction of tyrosinase activity.

Glutathione prevents damage caused by reactive oxygen species and free radicals by acting as an antioxidant and detoxifying agent [7,8]. Vitamin C is a potent antioxidant and helps in free radical scavenging [9]. It increases collagen production, strengthens skin barrier response, enhances skin repair process and reduces inflammation. Recently glutathione has come into focus in arsthetics because of its anti melanogenic properties. Glutathione causes lightening of the skin due to inhibition of tyrosinase enzyme [10-12].

It is available in both oral, topical and parentral forms. Since both oral and parentral forms have side effects, there has been a recent up-surge in the usage of glutathione as a mesotherapeutic agent.

There are many treatment modalities for melasma; however, there is no sure-fire method of treating this disease. Patients who are willing to undergo continued treatment are likely to be the best candidates. Finally, it is important for patients to maintain a good sun protection regimen to optimize the clinical results achieved with chemical peels. The main limitations of our study are - A small number of included patients and a sample size that was powered for PhGA only.

In a study by wannabe et al, 30 healthy adult women aged 30 to 50 years were taken up. The study design was a randomized, double-blind, matched-pair, placebo-controlled clinical trial [13]. Subjects applied Glutathione 2% lotion to one side of the face and a placebo lotion to the other side twice daily for 10 weeks. The skin melanin index was significantly lower with glutathione treatment than with placebo. But, the study had drawbacks as the sample size was small and the duration of study was short involving Filipino women.

Conclusions

Glutathione has been widely practiced by aestheticians for the treatment of facial melanosis mainly in combination of vitamin C, which is also a potent antioxidant. But, the studies conducted on the efficacy and safety of glutathione in mesotherapy are few. Infact there are only a few evidence based studies in the literature regarding the use of mesotherapy. Mesotherapy is a medical act and it is strongly advised against the use of this technique by non-medical personnel [14].

The use of two or more compounds in the same syringe is not recommended. Nevertheless in our experimental study,the mixture used was approved by the ethics committee for research purposes. We strongly recommend applying mesotherapy according to current recommendations.

Further randomized, double blinded and placebo controlled studies with larger number of patients needs to be conducted to validate the efficacy of glutathione in mesotherapy for melasma. The knowledge about the efficacy of mesotherapy is less and the level of evidence of mesotherapy as of now is low. More randomized, double-blind, placebo-controlled trials with larger sample size, long-term follow-up and well-defined efficacy outcomes are warranted to establish the relevance of this molecule in disorders of hyperpigmentation and skin lightening.

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