

## **To Study the Efficacy of Microneedling with Topical Vitamin C in the Treatment of Melasma**

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### **I. Introduction**

Melasma is a common acquired and circumscribed hypermelanosis of sun-exposed skin. The most common affected areas are cheeks, upper lips, chin and forehead, but other sun-exposed areas may be involved.<sup>(1)</sup> More common in darker and light brown skin types and predominantly affects women.

Women are predominantly affected; however, men are sometimes affected representing approximately 10% of the cases.<sup>(2)</sup> Various factors have role in the etiology of melasma such as genetic predisposition, hormonal influences, pregnancy, oral contraceptive pills (OCPs), UV radiation, thyroid disease, and drugs such as phenytoin.<sup>(3)</sup>

Three clinical presentations of melasma have been identified based on histopathological findings:

- 1) Epidermal melasma: Pigment deposition in basal and suprabasal layer.
- 2) Dermal melasma: Melanophages filled with melanin are found in superficial and middle dermis.
- 3) Mixed melasma

Many therapeutic options are available for melasma such as chemical peelings, light-based therapies (laser or intense pulse light), and topical agents. One of the new topical agents is vitamin C which interacts with copper ions at the tyrosinase-active site that leads to inhibition of tyrosinase enzyme. This action decreases melanin formation,<sup>(4)</sup> particularly the perifollicular one.<sup>(5)</sup>

A minimally invasive and painless approach of drug delivery to the skin is microneedling technology.<sup>(6)</sup> The micro-wounds created stimulate the release of several growth factors and induce collagen production.<sup>(7)</sup>

There are various other therapeutic options available. However, microneedling with topical vitamin C is one of the newer modality of treatment for melasma. Hence, this study was undertaken to evaluate the efficacy over other treatment options.

### **AIMS AND OBJECTIVES:**

To evaluate the effect of microneedling with topical vitamin C in the treatment of melasma.

### **II. Material And Methods:**

The study was carried out in the department of dermatology, venereology and leprosy at a tertiary care hospital.

30 patients of age above 20 years with clinical diagnosis of melasma falling under Fitzpatrick skin phototype 1,2 and 3 were included in the study.

Proper written consent was obtained before initiating the procedure.

At each session (every 2 weeks for 3 months), photos were taken and Melasma Area and Severity Index (MASI) score was calculated to assess the clinical improvement. Patients were followed up for 3 months.

### **INCLUSION CRITERIA:**

Individuals of age above 20 years with clinical diagnosis of melasma.

### **EXCLUSION CRITERIA:**

Patients on hormone replacement therapy or OCPs, history of bleeding disorders and any known allergy to vitamin C and Pregnant/lactating female were excluded.

### III. Methodology:

Topical anaesthetic cream was applied for 45-60 minutes over the affected area



Cream was then wiped off



Using dermaroller of 1.5mm & 540 needles, microneedling was done



Pin-point bleeding was then observed



Vitamin C serum was applied topically



The area was allowed to dry

#### POST PROCEDURE CARE AND FOLLOW UP:

Oral antibiotics were given to the patient for 7 days.

Patient was advised to take sun protection and use sunscreen even at home and repeat the application every 2 hours.

Patient was advised not to apply any active ingredient skin products or make up and not to do any strenuous activity for the first 24 hours after the procedure.

Patients were followed up every 2 weeks for 3 months.

### IV. Observation And Result:

Thirty consecutive patients aged above 20 years, satisfying the inclusion criteria, were drawn for the study at a tertiary care hospital in Jaipur.

**Table 1:** Gender of patients

Gender	No. of patients
Male	10
Female	20
Total	30

Among 30 patients, 10 ( 33%) were male and 20 (67%) were female, with a male to female ratio of 1:2

**Table 2:** Fitzpatrick skin phototype of patients

Fitzpatrick skin phototype	No. of patients
1	03
2	09
3	18
Total	30

The majority of cases were of Fitzpatrick skin type III.

**Table 3:** Affected area of patients

Area affected	No. of patients
Malar	18
Malar+ Centro facial	12
Total	30

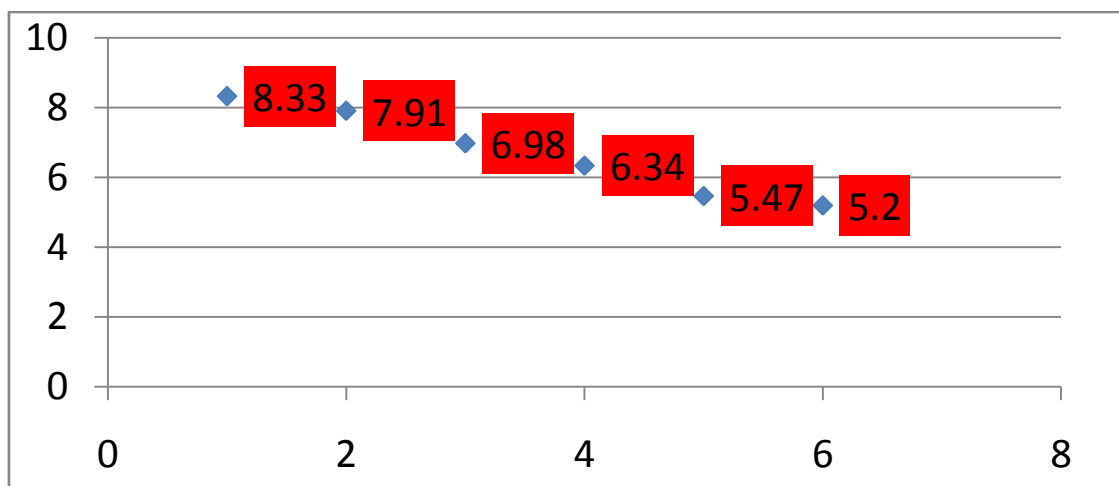
**Table 4:** Marital status of patients

Marital status	No. of patients
Single	22
Married	06
Divorce	02
Total	30

About 70% of the patients were married.

**Table 5:** MASI of the studied patients

Characteristics	Mean ± SD
MASI 1	8.33±4.52
MASI 2	7.91±4.28
MASI 3	6.98±4.11
MASI 4	6.34±4.05
MASI 5	5.47±3.98
MASI 6	5.20±3.93



In our study we observed, nearly all patients showed improvement at the end of session. Mean MASI Score in the first session was 8.33±4.52 and there was gradual decline in its mean value to 5.20±3.93 in the last session and the percentage of improvement of MASI score was not related to patient's age, marital status of patient and duration of melasma

### V. Discussion

In the present study carried out at a tertiary care hospital in Jaipur, included thirty patients with melasma. They received six sessions of microneedling with topical vitamin C 20% with two weeks interval between sessions. The majority of cases were of Fitzpatrick skin type III and this was consistent with several studies.<sup>(8)</sup>

Among the 30 patients, 33% were male and 67% were female, showing female preponderance.

Our results were comparable to a previous study that compared tranexamic acid microinjections versus tranexamic acid with microneedling in patients with melasma.<sup>(9)</sup>

Patients with darker Fitzpatrick skin phototypes showed less improvement than those with lighter one and similar findings were reported also in the study by Moin et al,<sup>(3)</sup> who stated skin phototypes III-VI as a risk factor with negative therapeutic outcome in the treatment of melasma.

There are various therapeutic modalities available but no single therapy is found to be 100% efficacious and cosmetically acceptable in majority of the patients.

Aim of the treatment of melasma should be its complete clearance, without any recurrence or post-treatment side effects.

In our study we observed, the percentage of improvement of MASI score was not related to patient's age, marital status, or duration of melasma. However, in other studies, long duration of melasma was associated with negative therapeutic outcome in such patients.

## VI. Conclusion

Microneedling with topical vitamin C is an effective treatment option for epidermal melasma. Microneedling allows the delivery of sufficient concentration of vitamin C into the skin and acts by stimulating the production of collagen and elastin at the dermal level, which helps to decrease the visible pigmentation.

It promotes fibroblast proliferation and upper dermal collagenesis, restores the upper dermal and basal membrane damage in melasma, disfavoring the contact of melanocytes with dermal released melanogenic stimuli such as endothelin, stem cell factor and hepatocyte growth factor. Additionally, a thicker epidermis can provide protection against UV damage.<sup>(10,11)</sup>

Microneedling with topical vitamin C is safe treatment modality with no side effects except for minimal pain due to microneedling and post-procedure erythema. Therefore, can be used as a maintenance therapy.

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