

A CLINICAL STUDY OF MICRODERMABRASION WITH VITAMIN C SERUM FOR FACIAL MELANOSSES AND REJUVENATIONSanjana A. S¹, S. Sacchidanand²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: AIMS AND OBJECTIVES: To study the effectiveness of microdermabrasion with Vitamin C serum for facial melanoses, superficial rhytides and rejuvenation. **MATERIALS AND METHODS:** Thirty patients were included in the study. Microdermabrasion was done on the face with machine pressure of 20mm of mercury. The face was wiped with saline soaked guaze and dried. One ml of Vitamin c serum with 15% concentration applied with droplet to entire face. The procedure was repeated at an interval of 15 days for 4 sittings. Photographs were taken and compared with patient's visual satisfaction and treating dermatologist's assessment before 1st sitting of the procedure and at the end of 4th sitting. **OBSERVATION AND RESULTS:** A total of thirty patients were included in the study and followed up for a period of two months. Male to female ratio was 3:7. The age of the patients ranged between 20 years and 35 years, with majority of them in the age group of 31-35 years. Among 15 patients with postinflammatory hyperpigmentation the treatment was not effective in 6 patients and mildly effective in 9 patients. Among 9 patients with photomelanoses the treatment was not effective in 3 patients and mildly effective in 6 patients. Among 3 patients each with superficial rhytides and facial rejuvenation moderately good effectiveness of the treatment was observed in 2 patients and 1 patient with superficial rhytides and facial rejuvenation respectively. Excellent result was obtained in 1 patient and 2 patients with superficial rhytides and facial rejuvenation respectively. **CONCLUSION:** MDA with Vitamin C serum is effective in the management of superficial rhytides and facial rejuvenation and it is either ineffective or only mildly effective in patients with post inflammatory hyperpigmentation and photomelanoses.

KEYWORDS: Microdermabrasion, Vitamin C serum, Facial melanoses.

INTRODUCTION: Microdermabrasion (MDA) is a mechanical resurfacing technique where in pressurized stream of aluminium oxide crystals are employed to abrade the skin to achieve superficial wounding. Stratum corneum, superficial debris, oil and dirt are removed immediately and wounding allowed to re - epithelialize and remodelling of collagen also takes place.

Vitamin C is used in skin care as a strong antioxidant, especially in regard to protecting the skin from sun damage. It strengthens the skin barrier and thickens the dermis. In high concentrations, it can reduce the appearance of skin discoloration. Most important, it promotes collagen production, which subsequently plumps the skin and lends it radiant and smooth.

In the present study the effectiveness of MDA with Vitamin C for various dermatological indications is studied prospectively.

INCLUSION CRITERIA:

- 1) Facial melanoses- Post Acne Pigmentation.
 - Photomelanoses

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- Post inflammatory hyperpigmentation.
 - Contact dermatitis to cosmetics.
 - Lichen planus pigmentosus.
- 2) Superficial rhytides.
 - 3) Facial rejuvenation.

EXCLUSION CRITERIA:

- 1) Melasma.
- 2) Inflammatory acne.
- 3) Active bacterial/ viral infection.
- 4) Keloidal tendency.
- 5) Acne scars.

MATERIALS AND METHODS: Thirty patients who fulfilled the inclusion criteria were selected for the prospective study. Counseling of patients with regard to outcome, side effects and complications of the procedure was carried out and written informed consent was obtained.

PROCEDURE: Test patch was done in post auricular area. After cleansing and degreasing the skin with spirit and acetone, patients were asked to close the eyes and eye protection ensured. Syringes filled with normal saline were kept for emergency eye wash. Pressure of the microdermabrasion machine was adjusted to 20mm of mercury and two passes planned per sitting. Hand piece held perpendicular to the skin, other hand stretching the skin with thumb and index finger, sweeping movements with uniform film of crystals on the skin were done to cover entire face in the order; right cheek, forehead, glabella, left cheek, chin, perioral area and nose. Eyelid skin and vermilion border were avoided. Crystals brushed off before next pass. Second pass done perpendicular to first set of passes. After brushing off the crystals, the face was wiped with saline soaked guaze piece and dried. One ml of Vitamin c serum with 15% concentration applied with droplet to entire face and gently rubbed onto the skin.

Patients were advised to apply sunscreen lotion regularly, everyday morning and afternoon until next sitting. No skin de pigmenting creams and oral medications were advised.

The procedure was repeated at an interval of 15 days for 4 sittings. Photographs were taken at each sitting and compared with patient's visual satisfaction and treating dermatologist's assessment before 1st sitting of the procedure and at the end of 4th sitting.

At the end of 4th sitting, patient's satisfaction was assessed by questionnaire and graded as unsatisfactory, fair, good and excellent. Physicians grading of effectiveness of the procedure was based on photographs taken and was classified as nil, mild, moderate and excellent improvement.

OBSERVATION AND RESULTS: The study was conducted in department of dermatology, Bangalore Medical College and Research Institute, Bangalore. A total of thirty patients were included in the study and followed up for a period of two months. Male to female ratio was 3:7. The age of the patients ranged between 20 years and 35 years, with majority of them in the age group of 31-35 years.

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Age and sex distribution of Patients:

Age	Female	Male	Total
20-25 years	8	Nil	8
26-30 years	2	8	10
31-35 years	11	1	12

Table 1

Distribution of clinical Indications:

Etiology	Male	Female
Post inflammatory hyperpigmentation (PIH)	1	14
Superficial rhytides	1	2
Facial rejuvenation	1	2
Photo melanoses	6	3

Table 2

The patient's satisfaction grading with effectiveness of the Procedure:

Patient satisfaction grades	Unsatisfactory	Fair	Good	Excellent
PIH	3	10	2	
Superficial rhytides				3
Facial rejuvenation			1	2
Photomelanoses	5	4		

Table 3

The physician grading of effectiveness of the Procedure:

Dermatologist observation	Nil	Mild	Moderate	Excellent
PIH	6	9		
Superficial rhytides			2	1
Facial rejuvenation			1	2
Photomelanoses	3	6		

Table 4

DISCUSSION: Microdermabrasion is a process that employs aluminium oxide crystals and negative pressure to peel superficially the outer surface of the skin¹. Microdermabrasion has the advantages of least bleeding, fewer complications, and no need for local anesthesia in comparison with other superficial peeling techniques.²

The mechanism by which microdermabrasion produces abraded skin is based on high-speed compressed aluminium oxide crystals. The depth of peeling is controlled by the programmed

pressure, not by the touch of the operator². The machine pressure used in the present study was 20 mm of mercury and the depth of peeling was precisely controlled. This can theoretically prevent deep tissue damage and allow precise control of ablation of the skin.

Histopathological variations following MDA are known to Occur:

- 1) Thinning of stratum corneum.
- 2) Increased thickness of epidermis.
- 3) Remodelling of collagen, elastic fibres.
- 4) Dermal oedema.
- 5) Vascular ectasia with perivascular mononuclear infiltrate.

Side effects of MDA include erythema, oedema, increased skin sensitivity, petechiae, purpura, transient hyperpigmentation and xerosis. None of the patients in the present study had any side effects mentioned above. The complications following MDA include; pulmonary fibrosis, conjunctival congestion, foreign body reaction of aluminium oxide crystals, cross contamination if sterilization not followed, eye irritation, and superficial punctuate keratitis.

Advantages of MDA are it is safe during pregnancy and lactation, elimination of anaesthesia, no downtime required, easy to perform, no surgical skills required and less time consuming. The approximate time required for each patient in the present study was 15 minutes. Disadvantages of MDA include repeated sittings, not useful for deep scars, cannot treat deep rhytides and results are not sustainable.

Vitamin C is crucial to the body's immune system, and serves as an aggressive free-radical fighter. Humans are one of the few animal species that cannot produce vitamin C internally, and must incorporate it into diets and supplements to ensure it can perform its many beneficial functions in the body.

Vitamin C is a prime ingredient of collagen, the substance that binds cells together. Collagen metabolism and production are key attributes of healthy, radiant, younger looking skin. Collagen, in fact, depends on vitamin C, which implies the vitamin's importance to healthy, attractive skin. Stable collagen production fights wrinkles, and ensures evenness in the skin's tone and texture. Vitamin C's function as an antioxidant also benefits the skin, as it is able to protect the skin from damaging effects of free radicals.

Vitamin C (L-ascorbic acid) has important physiologic effects on skin, including inhibition of melanogenesis, promotion of collagen biosynthesis, prevention of free radical formation, and acceleration of wound healing.^{3,4,5} The stratum corneum (SC) provides the principal barrier that limits the percutaneous amount and rate of topical vitamin C application.^{6,7} Vitamin C is useful in the form of its derivatives, which include L-ascorbic acid, ascorbyl palmitate, and magnesium ascorbyl phosphate. Vitamin-C products enhance the effects of cosmetic treatments, such as microdermabrasion and chemical peels. A serum, often lighter and thinner in consistency compared to a moisturizer, is applied to the face after cleansing, and before the moisturizer. Serums usually have specific functions, such as anti-aging or free-radical protection. Serums are able to penetrate deep into the skin layers, while moisturizers address only the superficial surface tissue and its condition.

Microdermabrasion ablated the stratum corneum layers with minimal disruption of the skin barrier properties according to transepidermal water loss (TEWL) levels. The influx and skin

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deposition of vitamin C across microdermabrasion-treated skin was approximately 20-fold higher than that across intact skin⁸. In the present study 15% Vitamin C serum was utilized immediately after MDA after brushing off the aluminium crystals. A linear correlation was found to exist between skin deposition of vitamin C and TEWL exposed by microdermabrasion at various durations.

The effectiveness of MDA with Vitamin C for individual clinical indications is not discussed in the published literature. In the present study, among 15 patients with PIH the treatment was not effective in 6 patients and mildly effective in 9 patients. Among 9 patients with photomelanoses the treatment was not effective in 3 patients and mildly effective in 6 patients. Hence the utility of this treatment for PIH and photomelanoses was observed to be very limited.

Three patients each with superficial rhytides and facial rejuvenation were assessed for effectiveness of the treatment. Moderately good effectiveness of the treatment was observed in 2 patients and 1 patient with superficial rhytides and facial rejuvenation respectively. Excellent result was obtained in 1 patient and 2 patients with superficial rhytides and facial rejuvenation respectively. Thus, MDA with Vitamin C serum was observed to be effective in patients with superficial rhytides and facial rejuvenation.

In spite of limitations in the study including small sample size and absence of control group the following conclusions and recommendations can be made.

CONCLUSION:

1. MDA with Vitamin C serum is effective in the management of superficial rhytides and facial rejuvenation.
2. MDA with Vitamin C serum is ineffective or only mildly effective in patients with post inflammatory hyperpigmentation and photomelanoses. It should be used sparingly in selected cases only.

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