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Dermatology

To Evaluate the Efficacy of Tranexamic Acid Microinjection in Melasma

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Abstract **Original Research Article**

Melasma is one of the most common acquired and distressing pigmentary skin disorder characterised by symmetrical hyperpigmentation of sun exposed areas of face. Plethora of treatment options available in market including various topical, oral and laser therapy with unsatisfactory results and recurrence. Tranexamic Acid, an antifibrinolytic drug, is now gaining popularity as a depigmenting agent. We have done this study to evaluate the effect of tranexamic acid microinjection in two groups of melasma patients at two different concentrations and frequency of injection and access the response in respective group.

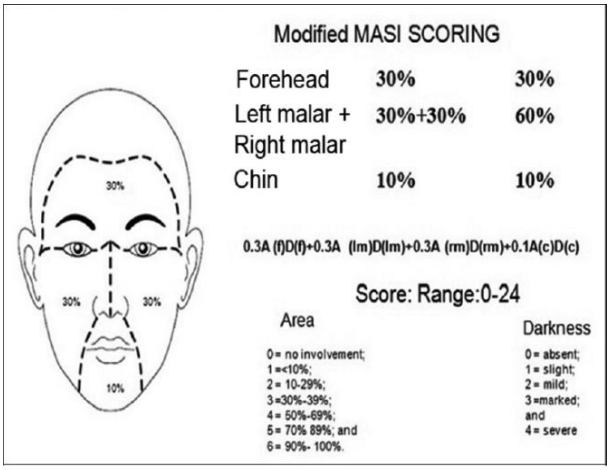
Keywords: Melasma, Antifibrinolytic, Hyperpigmentation, microneedling, Pigmentary.

INTRODUCTION

Melasma is an acquired symmetrical hypermelanosis of sun exposed areas of face, mainly the malar area [1]. Most common in reproductive age and factors like sunlight exposure, genetics, oral contraceptives, thyroid dysfunction and pregnancy are implicated in its pathogenesis [2]. Treatment majorly includes avoidance of sun exposure and use of sunscreens. Other modalities like hypopigmenting agents, superficial peeling agents such as glycolic and lactic acid and laser therapy are used but they often lead to unsatisfactory results and a high recurrence [3]. Hence, the quest for newer and safer depigmenting agents continues. Tranexamic Acid, an antifibrinolytic drug, is now gaining popularity as a depigmenting agent [4].

MATERIAL AND METHODS

This prospective study was conducted in the dermatology department at Teerthanker Mahaveer Hospital, Moradabad, Uttar Pradesh from January 2019 to May 2019. Sample size of 45 was taken. 40 patients completed the study. Patients were randomly selected in group A and group B. Randomization was done by random number allocation. After obtaining the written informed consent, history was taken and clinical examination was done. Type of melasma was determined by woods lamps. Patients were advised the avoidance of sun exposure and regular use of sunscreen.



Inclusion Criteria

1. Both male and female patients with melasma, of age group 18-50 years with skin phototype of II to V according to fitzpatrick's classification.

Exclusion Criteria

1. Patients with history of hypersensitivity to tranexemic acid, clotting disorders, use of photosensitizing drugs or oral anticoagulants.
2. Pregnant and lactating females, use of oral contraceptive pill within 6 months from the study and patients with history of previous treatment for melasma in the past one month.

In Group A patients –

2U of tranexamic acid 40U/ml was drawn in a 30 gauge insulin syringe and diluted with normal saline up to 1 ml to get a concentration of 4mg/ml approximately. After applying topical anaesthesia .05 ml of trnaxemic acid was injected intradermally at a distance of 1 cm to cover the entire hyperpigmented area. For 3 months patients was followed up every 2 weeks with a total of 6 sittings (Group A).

Group B patients were given an increased dose of tranexamic acid 8mg/ml i.e 4U was drawn in a 40U/ml 30 gauge insulin syring and diluted with normal saline up to 1ml. 05 ml of it was injected at a distance of 1 cm .Patients were followed up after every one week for next one and a half months with a total of 6 sittings.

At final visit (after 6 sittings)

Photographs were taken and modified MASI was calculated to compare with the one taken at intial visit. Subjective response by the patient to compare the effects of the different doses given at different follow up intervals.

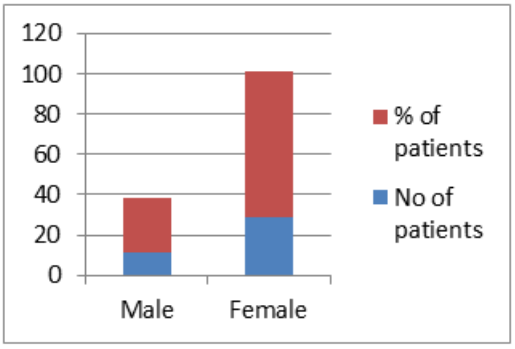
Subjective response to treatment according to patient was graded as-

1. No response	No improvement
2. Mild response	<25% improvement
3. Moderate response	25-50% improvement
4. Good response	50% -75% improvement
5. Excellent respone	>75% improvement

Statistical analysis was done using SPSS software version 20. Mean and standard deviation was used for contionous variables. P value of less than .05 was considered significant.

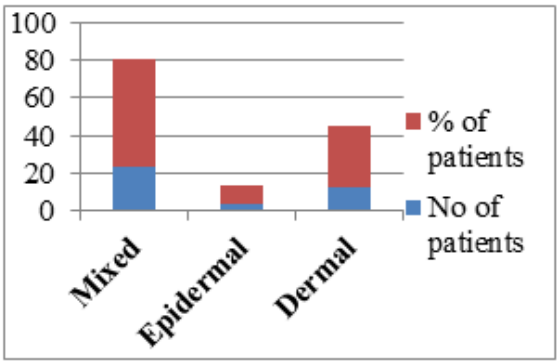
RESULTS

Out of 45 patients enrolled in the study, 40 patients completed the study. The number of female (29) were more than male (11) (Table-1).

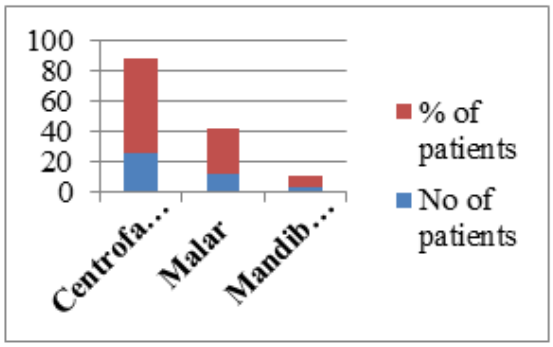


The most common type of melasma was centrofacial. Under wood's lamp, mixed type was most common (Table 2). All the patients had Fitzpatrick skin type IV or V.

Type Of Melasma	No of patients	% of patients
1. Mixed	23	57.5
2. Epidermal	4	10
3. Dermal	13	32.5

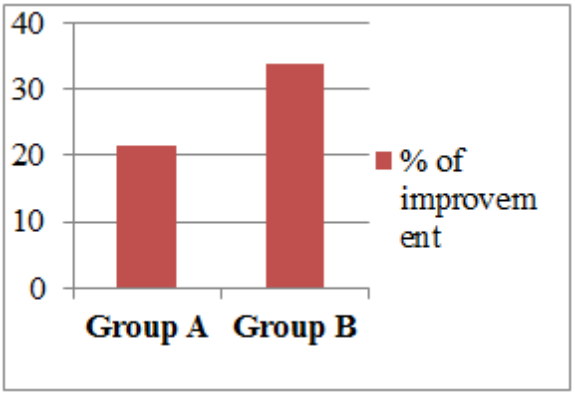


Pattern Of Melasma	No Of Patients	% of patients
Centrofacial	25	62.5%
Malar	12	30.1%
Mandibular	3	7.4%



Higher clinical efficacy was observed in Group B(33.8%) compared to Group A(21.4%) with p value <.05 (statistically significant).

mMASI	Group A	Group B
Before Treatment	12.89+-1.25	11.91+_1.31
After Treatment	10.61+-1.12	8.21+-1.97
Percentage of involvement	21.4	33.8



Comparative effect of TXA in both the groups

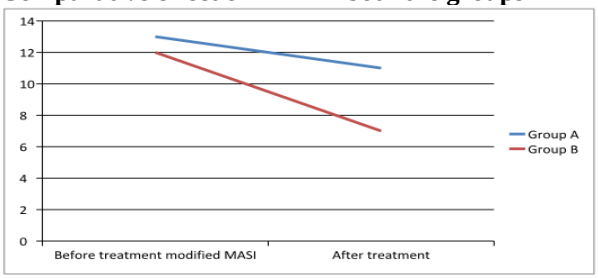
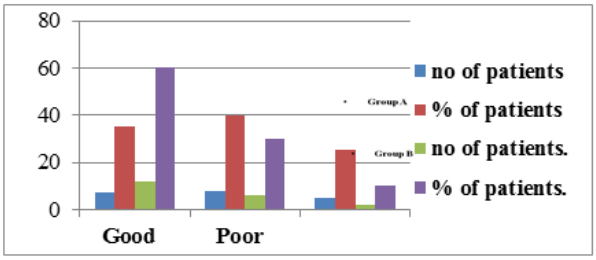


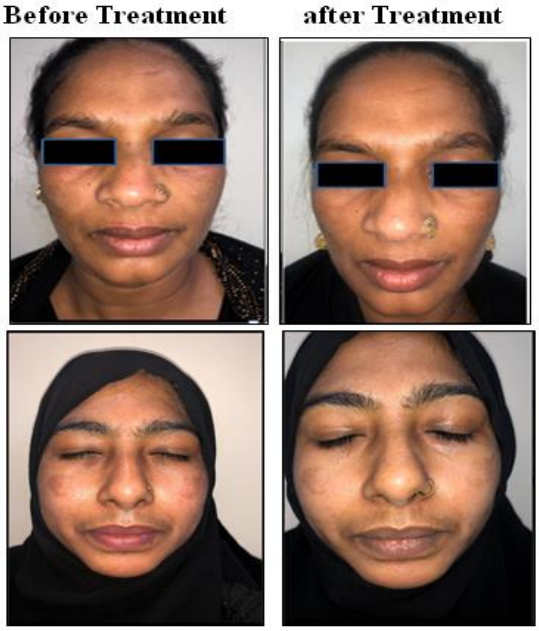
Table-4: Shows the response to treatment in study group

Response to treatment	Group A (no of patients)	Group A (% of patients)	Group B (no of patients)	Group B (% of patients)
Good	7	35	12	60
Poor	8	40	6	30
No response	5	25	2	10
Total	20		20	

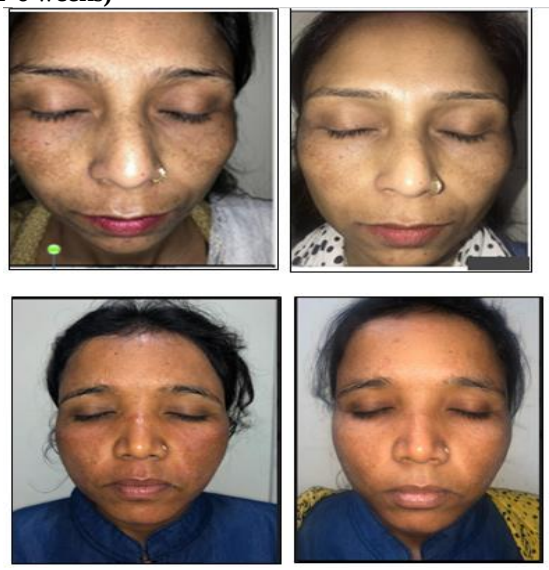


No excellent response seen. No major side effects were observed except for mild pain and erythema in the patients, which lasted for 2–3 days.

Group A patients (4mg/ml of TA at two weekly interval for 6 weeks.)



Group B patients (6mg/ml of TA at weekly interval for 6 weeks)



DISCUSSION

Melasma refers to blotchy pigmentation on skin mainly on the centrofacial and malar area [5]. There is no single universally accepted effective treatment for melasma although a lot of combination of modalities are used [6]. Sadako in 1979 accidentally reported use of tranexamic acid (oral) while treating urticaria in middle-aged women [7]. TXA suppresses melanogenesis by regulating tyrosinase transcription in addition to its anti-inflammatory action. Antiplasmin activity of TA works through inhibition of UV induced

melanin synthesis [8]. Tranexamic acid was reported to be useful in melasma by Nijor in 1979 in Japan [9].

Localized microinjection, also known as mesotherapy, is a widely used technique [10]. It aims at directly applying an adequate amount of medication at the given site thus avoiding oral medications and allowing lower dosage of drugs to be used. In our study, we evaluated the efficacy of intradermal injection of tranexamic acid in melasma using different concentrations and at different follow up interval. Similar results were seen in a study, conducted in 2006 by Lee J H *et al.*, on localized intradermal microinjection of tranaxemic acid for treatment of melasma in Asian patients: a preliminary clinical trial. In this study after applying topical anaesthesia .05ml of tranaxemic acid (4mg/ml) was injected intradermally in melasma that were followed up every week for 12 weeks [11]. Veggalam *et al*., in 2017 conducted a study on intralesional tranaxemic acid: Safe and effective way of treatment of melasma. In this one ml of 0.5 mg/ml TA was given in the area affected by melasma, weekly for 4 weeks. A significant improvement of 50% was seen [12].

CONCLUSION

The thirst for a fair skin can never be fully quenched. Hence the quest for newer and safer depigmenting agent continues. Tranexamic acid provides rapid and sustained improvement in the treatment of melasma. It is easily available and affordable. Oral routes of txa in undoubtedly efficacious, but the results of microinjection, while encouraging, can probably be enhanced by either increasing the frequency or increasing the concentration of preperation.

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