

Comparitive Study of 15% Trichloroacetic Acid versus Oral Tranexemic Acid in Facial Melasma.

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Abstract:

Introduction: Melasma is the most common pigmentary disorder in India, with incidence of approximately 1.5% & 33.3%. Affecting all the races, it is most prevalent in the Hispanics and Asians of skin types IV, V, and VI with Centro-facial, malar, and mandibular distribution. Despite of the various treatment modality and refractory nature of disease, the results are mostly unsatisfactory, there arises a need to study oral formulation efficacy versus the infamous chemical peel modality.

Material & Methods: A randomized, prospective, Comparative, Interventional study was conducted on 60 patients having melasma attending Out Patient Department of Dermatology of tertiary care hospital in India and satisfying inclusion and exclusion criteria during the period from September 2021 to November 2021. Institutional ethics committee permission was taken. Patients were divided into 2 groups via chit system, GROUP A was treated with 15% trichloroacetic acid peel fortnightly versus GROUP B was given oral tranexamic acid 250mg BD and wereevaluated with Melasma Area and Severity Score (MASI) on 0th, 4th, 8th and 12th week.

Results & Observations: The most common age group amongst study population was 36-45 years (44%) followed by 26-35 years (28%). In our study the most common type of melasma was centofacial (52%) followed by malar (43%), where in the most frequent pattern seen was mixed type (57%) followed by epidermal type (22%). Significant reduction in mean MASI score was seen at 4th week where in reduction of mean MASI was more than in oral tranexamic group at 12 week.

Conclusion: In the era of cosmetology, superficial Chemical peel is a safe and effective mode of treatment with good clinical response with added advantage of facial rejuvenation. Oral tranexamic acid is an affordable option with minimal side effect with good results, it can be considered as an adjuvant because of the high relapse rate.

Keywords: Trichloroacetic Acid, Oral Tranexemic Acid, Facial Melasma.

INTRODUCTION:

Melasma a name derived from the Greek melas, meaning black, is used to describe an acquired brown hypermelanosis of face and neck. Melanosis or “black degeneration” was the first term used and the word “chloasma symmetricum” was formulated in 1919 wherein another word “chloasma” was derived from Greek word “chloazein”, meaning “to be green”¹. It is a common chronic refractory acquired hyperpigmentation of the skin having a serious impact on the quality of life.¹ It is characterized by tan-brown macules and patches with a predilection for sun exposed areas, in particular the cheeks, forehead, upper lip, nose, and chin. Melasma is the most common pigmentary disorder in India, with incidence of approximately 1.5% & 33.3%.² Affecting all the races, it is most prevalent in the Hispanics and Asians of skin types IV, V, and VI with Centro-facial, malar, and mandibular distribution.³

Multiple factors have been implicated, it is hypothesized that following exposure to UV irradiation or another inducer, hyper functional melanocytes have been found.⁴ The etiopathogenesis is multifactorial like pregnancy, contraceptives, estrogen and pregestational hormones, cosmetic ingredients, drugs, sunlight, genetic predisposition. The role of female hormonal activity has been suggested by the increased frequency of occurrence of melasma in pregnancy and in those on oral contraceptive pills, oestrogen replacement therapy and estrogen treatment for prostatic cancer.⁵ Clinically, melasma can be divided into centrofacial, malar, and mandibular, according to the pigment distribution on the skin. By Wood’s light examination, melasma can be classified into epidermal, dermal or mixed type. Studies have found increased vascularity and angiogenic factor in melasma.⁶ Management of melasma involves the use of topical medications such as hydroquinone, tretinoin, azelaic acid, kojic acid, corticosteroids and their various combinations; chemical peels such as glycolic acid, salicylic acid, lactic acid, trichloroacetic acid, phenol etc.; and laser treatments. Tranexamic acid (TA), an anti-plasmin agent, decreases the generation of arachidonic acid, which leads to a reduction in melanocyte-stimulating hormone (MSH) and decrease in pigmentary production.⁶

Despite of the various treatment modality and refractory nature of disease, the results are mostly unsatisfactory, there arises a need to study oral formulation efficacy versus the infamous chemical peel modality

METHODOLOGY

A randomized, prospective, Comparative, Interventional study was conducted on 60 patients having melasma attending Out Patient Department of Dermatology of tertiary care hospital in

India and satisfying inclusion and exclusion criteria during the period from September 2021 to November 2021. Institutional ethics committee permission was taken.

INCLUSION CRITERIA

- All patients attending out patient department between October 2021-march2022
- Having normal baseline investigation and coagulation profile
- Voluntary participation and informed consent

EXCLUSION CRITERIA

- H/o bleeding disorders, oral anticoagulant drugs.
- Pregnant and lactating mothers
- Active infection on face

Patients were divided into 2 groups via chit system, GROUP A was treated with 15% trichloroacetic acid peel fortnightly versus GROUP B was given oral tranexamic acid 250mg BD and were evaluated with Melasma Area And Severity Score (MASI) on 0th, 4th, 8th and 12th week. Patients from both the groups were followed up for 3 months post treatment. Both the groups were given sunscreen with SPF 30 throughout the study type. All the patients were explained about the procedure, the purpose of the study and Informed consent were taken. Proper history, wood lamp's examination and baseline investigation with coagulation profile was done along with pre and post photograph

PROCEDURE

The patient was asked to wash the face with water and degreased with 99.5% acetone. The eyes were covered and the sensitive areas of face were protected with Vaseline. The single coat of 15% TCA was applied with cotton tip applicator over face in cosmetic units and TCA peel (very minute speckles of frost or frost) was seen. Neutralization of the peel was done by washing face with water for 2 minutes. The patient was advised to apply sunscreen before leaving the procedure room.

Melasma Area and Severity Index (MASI) score at the beginning and after each peel and the results were evaluated statistically. The face was divided into the four regions (forehead 30%, right malar region 30%, left malar region 30% and chin 10%) and each area was given numerical value (A, 0-6). The sum of severity of darkness (D, 0-4) and homogeneity (H, 0-4) was multiplied by the numerical value and percentage of the total area involved. These values were added to obtain MASI score.

MASI = 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

Statistical Analysis

All the collected data was entered in Microsoft Excel sheet and then transferred to SPSS software ver. 22 for analysis. Qualitative data was presented as frequency and percentages and analyzed using chi-square test. Quantitative data was presented as mean and SD and compared by t-test. P-value < 0.05 was taken as level of significance.

RESULTS:

Table 1: Sex Distribution amongst Study Population

			Groups		Total
			Group A	Group B	
Sex	Female	N	23	24	47
		%	77%	80%	78%
	Male	N	7	6	13
		%	23%	20%	22%
Total		N	30	30	60
		%	100.00%	100.00%	100.00%

The most common age group amongst study population was 36-45 years (44%) followed by 26-35 years (28%) and 18-25 years (18%) and more than 45 years (14%). There was female preponderance (78%) amongst study population as compared to males (22%).

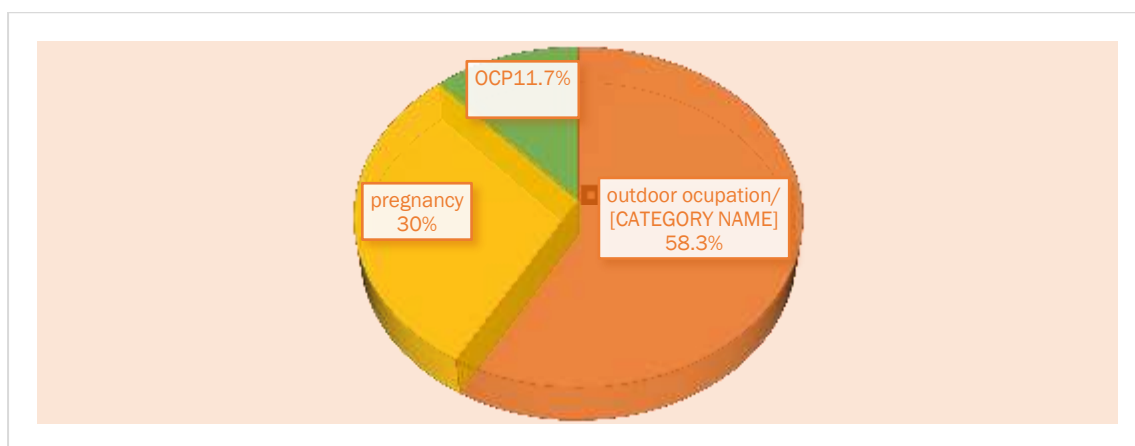


Figure 1: Distribution of Precipating Factors amongst Study Population

The most common aggravating factor in our study outdoor occupation (58%), followed by post pregnancy (30%) and oral contraceptive pills (11.7%).

Table 2 : Distribution of Subjects Based on Type and Pattern of Melasma and The Fitzpatrick Skin Type Involvement.

		No. of patients	Percentage
Type of melasma	Centrofacial	31	52.0
	malar	26	43.0
	mandibular	3	5.0
Pattern of melasma	Epidermal	22	37.0
	Dermal	4	7.0
	Mixed type	34	57.0
Fitzpatrick skin type	III	16	27.0
	IV	28	47.0
	V	16	26.0

In our study the most common type of melasma was centrofacial (52%) followed by malar (43%), where in the most frequent pattern seen was mixed type (57%) followed by epidermal type (22%). In accordance with our study, fitzpatrick skin type 4 (47%) was most frequently involved followed by skin type 3 (table 2).

Table 3: MASI Score Comparison between Two Groups

MASI score	Groups				Std error of difference	t-value	P value
	Group A(TCA peel)		Group B(oral TXA)				
	Mean	SD	Mean	SD			
0 week	14.41	1.2	14.58	1.4	0.337	0.50	0.615
4th week	12.19	1.1	10.65	1.2	0.297	5.18	0.001
8th week	10.22	0.9	7.18	0.9	0.232	13.08	0.001
12th week	8.05	0.6	5.39	0.7	0.168	15.80	0.001

In present study, significant reduction in mean MASI score was seen at 4th week where in reduction of mean MASI was more than in oral tranexamic group at 12 week.

Table 4: Recurrence Rate among Study Population

			Groups		Total
			Group A	Group B	
Recurrence	Yes	N	4	9	13
		%	13%	30%	22%
	No	N	26	21	47
		%	87%	70%	78%
Total		N	30	30	60
		%	100.00%	100.00%	100.00%

The recurrence rate after a follow up period of 3 months in oral tranexamic acid group was more (30%) when compared to 15% TCA peel (13%).

Table 5 : Adverse Effect Between Both Group

Adverse Effect	GROUP A	GROUP B
Erythema	1(3%)	0
Burning	4(13%)	0
Hypopigmentation	0	0
Acneform Eruption	0	0
Abdominal Discomfort	0	3(10%)
Thromboembolic Effect	0	0

Adverse effects were minimum in both the group seen with in group A, patients who received 15% Trichloroacetic acid peel like burning (13%) followed by erythema (3%), whereas in group B receiving oral tranexamic acid mild abdominal discomfort (10%) was the most frequently experienced.

DISCUSSION:

Melasma is one most common, pigmentary disorder characterized by irregular light to dark brown macules and patches commonly involving the cheeks, forehead, upper lip, nose and chin. Multiple etiopathogenic factors are responsible for melasma like oral contraceptive pills, pregnancy, estrogen replacement therapy, anti convulsant therapy.⁴Tranexamic acid (trans- 4- amino methyl cyclohexane carboxylic acid) is a plasmin inhibitor,it prevents binding of

plasminogen to keratinocyte which results in less arachidonic acid and diminished ability to produce prostaglandins and subsequently reduces melanogenesis in melanocyte.⁷ Superficial peel are more preferred over deep peels for being safe and to prevent post inflammatory hyperpigmentation in skin of colour.⁸ In present study the most common age group involved was 36-45 years,whereas similar study conducted by Achar and Rathi the average age was 33.45 years.⁹ Female preponderance was seen in our study by 78% similar to puri et al 6.5:1.¹⁰ The prominent type of distribution was centrofacial (52%) followed by malar (43%) in accordance with study by krupashankar et al.¹¹ The most common pattern of melasma was mixed type (57%) followed by epidermal type (37%), similarly in other studies epidermal was found to be the most common type.¹² The most common aggravating factor in our study outdoor occupation(58%),followed by post pregnancy (30%) and oral contraceptive pills (11.7%)similar to Achar and Rathi et al.⁹ Fitzpatrick skin type 4 (47%) followed by type 3(27%) was similar to Kumari and Thappa et al.¹²Study conducted by kumari and thappareported trichloroacetic acid peel showing quicker improvement after 2 peels when

compared to glycolic acid but after the end of peeling session both groups showed equal efficacious response.¹² In our study as well significant improvement in mean MASI score was noticed earliest at 4th week.¹³ Sharma et al, compared oral tranexamic acid 250mg BD with intradermal injection of tranexamic acid 4mg/ml concluded both groups had satisfactory results. The efficacy of oral TXA 250 mg twice daily was also reported with a good to very good response observed in 80% of patients with oral TXA given for 4 months and fair to excellent results in 88% of patients treated for 6 months in two separate studies.^{6,10} In present study significant reduction in mean MASI score was seen at 4th week which was similar to the study conducted by Chowdhary B et al with higher dose of oral tranexamic acid.¹³ The most common side effect in TCA peel group burning (13%), erythema (3%) whereas studies have reported erythema followed by irritation and burning.^{9,10} Side effect in the oral tranexamic acid group were minimal abdominal discomfort (10%) and relieved with tab pan 40mg and it did not result in discontinuation of treatment which was in accordance with study conducted by Chowdhary et al.¹³ Relapse was more in the oral tranexamic group in present study, similar results were seen in study by Chowdhary et al, also interestingly relapse rate was higher with higher dose of tranexamic acid.¹³

CONCLUSION:

In the era of cosmetology, superficial Chemical peel is a safe and effective mode of treatment with good clinical response with added advantage of facial rejuvenation. Oral tranexamic acid is an affordable option with minimal side effect with good results, it can be considered as an adjuvant because of the high relapse rate. We recommend further studies with different modality of treatment in combination with oral tranexamic acid.

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Figure 4: before and after in oral tranexamic acid group



FIGURE 5: RECCURENCE IN ORAL TRANEXEMIC ACID GROUP AFTER 3 MONTHS



Figure 5 :before and after images in 15 % TCA group