

# Comparative evaluation of hydroquinone, tretinoin and mometasone versus glycolic acid versus trichloroacetic acid peel in melasma

Seeba Hussain\*, Md Raihan\*\*, Abhijeet Kumar Jha<sup>†</sup>, Satyaki Ganguly<sup>††</sup>, Kranti Chandan Jaykar<sup>¶</sup>, Paritosh Kumar Banerjee\*

\* Department of Dermatology, Venereology and Leprosy, Katihar Medical College, Katihar, India

\*\* Department of Dermatology, Venereology and Leprosy, Rama Medical College, Ghaziabad, India

<sup>†</sup> Department of Dermatology, STD and Leprosy, All India Institute of Medical Sciences, Patna, Bihar, India

<sup>††</sup> Department of Dermatology and Venereology, Pondicherry Institute of Medical Sciences, Pondicherry, India

<sup>¶</sup> Department of Dermatology, Indra Gandhi Institute of Medical Sciences, Patna, India

## Abstract

**Objective** Comparative evaluation of 2% hydroquinone, 0.025% tretinoin and 1% mometasone versus glycolic acid and trichloroacetic acid peel alone in melasma.

**Methods** Seventy five patients were included in the study. Total duration of study was one and a half years. Melasma area severity index (MASI) score of more than 10 were included in the study. The patients were divided into three groups. Group A consisted of 25 patients and were given 2% Hydroquinone, mometasone 1% and 0.025% tretinoin. Group B consisted of 25 patients and underwent glycolic acid peel. Group C consisted of 25 patients and underwent trichloroacetic acid peel.

**Results** Group A had better response, followed by group B and group C, respectively.

**Conclusion** Combination of hydroquinone, mometasone and tretinoin is a good option to treat melasma only when used judiciously along with sunscreen, whereas glycolic acid peels are a safer option with fewer side effects.

## Keywords

Melasma, hydroquinone, tretinoin, mometasone, glycolic acid, trichloroacetic acid.

## Introduction

Melasma is one of the most common pigmentary disorders seen in dermatology outpatient department. Melasma is known to have a

multifactorial etiology. Contributing factors include increased UV exposure, pregnancy, cosmetics, genetic factors, endocrine factors, and hormonal therapy.<sup>1-3</sup> It is a definite cause of cosmetic concern in females. Melasma is a dysfunction of pigmentary system, resulting in an irregular brown or grayish-brown facial hypermelanosis. Different topical and peeling agents have been tried for the treatment of this recurrent condition with varied success. Glycolic acid and trichloroacetic acid (TCA) have been

---

## Address for correspondence

Dr. Seeba Hussain,  
Department of Dermatology, Venereology and  
Leprosy,  
Katihar Medical College, Katihar, India  
Email: drraihansshakeel@gmail.com

used alone and also in combination to treat melasma.<sup>4,5</sup>

## Methods

Seventy-five patients were included in the study. Total duration of study was one and a half year. The study was conducted in a tertiary care centre in Bihar in the Department of Dermatology, Venereology and Leprosy outpatient section after approval of the ethical committee of the institute. Patients were diagnosed clinically and Wood's lamp examination was done to differentiate epidermal, dermal and mixed pattern of melasma. Patients with melasma area severity index (MASI) of more than 10 were included in the study. The patients were divided in to three groups. Group A consisted of 25 patients who were treated with topical 2% hydroquinone, mometasone 1% and 0.025% tretinoin. Group B consisted of 25 patients and underwent glycolic acid peel. Group C consisted of 25 patients and underwent TCA peel. Patients with previous history of herpes, keloids, hypertrophic scars, pregnancy, on isotretinoin, oral contraceptive pills, non-compliant patients, hypersensitivity to any of the treatment regimen were excluded from the study. Patients' consent was taken prior to the study. Sunscreen with SPF >30 was advised during daytime. During every visit, clinical improvement was graded as shown in **Table 1**.

Group A were given 2% hydroquinone, mometasone 1% and 0.025% tretinoin to be applied at night followed by judicious use of sunscreen in the morning. Group B underwent glycolic acid peel with concentration of 20-35% at 2 weekly interval with time being increased on an incremental basis starting with thirty seconds, one minute, one and half minutes, two minutes in different concentrations. All Patients

Grade	Clinical improvement
1	Slight improvement barely noticeable (<25%)
2	Moderate improvement, noticeable (25-50%)
3	Obvious improvement (50-75%)
4	Very marked improvement (>75%)

were advised a sunscreen with SPF>30 in the morning. Group C underwent TCA peel with concentration of 10-20% at 2-weekly interval with time being increased on an incremental basis for a total of six sittings.

## Results

Majority of the cases were females and they comprised 80% of the total cases with housewives as the majority constituting 49.5% of the cases. Clinical pattern of the malar type was seen in 66.5% of the cases. Duration of melasma was less than 5 years in 67% of the patients. Positive family history was elicited amongst 35% of cases. History of use of cosmetics was present in 73.5% of them. Most common aggravating factor was sunlight exposure, seen in 17.5% of cases. On Wood's lamp examination accentuation of the lesion was seen in 26% of cases.

**Table 2** shows the treatment response in three groups. Grade 4 response i.e. >75% improvement was seen in 10 (40%) patients of group A, 3 (12%) of group B and 2 (8%) patients of group C. Similarly, grade 3 improvement i.e. 50%-75% was seen in 6 (24%), 9 (36%) and 8 (32%) patients in group A, group B and group C, respectively. The respective grade 2 improvement i.e. 25-50% in three groups A, B and C was 20%, 28% and 32%. Slight improvement i.e. grade 1, <25% was seen in 16%, 28% and 28% patients in three groups, respectively.

**Table 1** Grades of clinical improvement.

**Table 2** Grades of improvement in three groups, group A (hydroquinone + mometasone + tretinoin), group B (glycolic acid peel), and group C (trichloroacetic acid peel).

Grades of improvement	Group A	Group B	Group C
Grade 4 (very marked improvement, >75%)	10 (40%)	3 (12%)	2 (8%)
Grade 3 (obvious improvement, 50-75%)	6 (24%)	9 (36%)	8 (32%)
Grade 2 (moderate improvement, noticeable, 25-50%)	5 (20%)	7 (28%)	8 (32%)
Grade 1 (slight improvement barely noticeable, <25%)	4 (16%)	7 (28%)	7 (28%)

Overall, group A had better response, followed by group B and group C, respectively.

## Discussion

Melasma is one of the commonest pigmentary disorders seen in dermatology outpatient. It is The exact pathogenesis is unknown though the major triggering factors are sunlight and female hormones. Difficult to treat melasma also has a dermal component. Three clinical patterns are generally seen: malar, centofacial and mandibular type. The principles of therapy include protection from UV light, inhibition of melanocyte activity and melanin synthesis and the disruption and removal of melanin granules.<sup>6</sup> An effective treatment for epidermal hypermelanosis is a combination of HQ, a topical steroid, and tretinoin. The combination strongly inhibits the production of melanin without the destruction of melanocytes.

Kligman and Willis<sup>7</sup> proposed a preparation containing HQ 5%, tretinoin 0.1%, and dexamethasone 21-acetate 0.1%, to be applied daily for 5 to 7 weeks, and it was found to be effective in the treatment of melasma. In addition, they discovered that omitting any one component resulted in a loss of effectiveness. Lowering the concentrations of the components decreased the frequency of irritancy, but also decreased the potency of the mixture.<sup>7</sup> Javaheri *et al.*<sup>8</sup> performed a study with 25 women with melasma. The degree of improvement was measured based on changes in MASI scores. The response of each patient was graded as no response (no decrease in MASI score), mild (<25%), moderate (25% to<50%), good (50%

to<75%), and very good ([75%). A total of 23 patients completed the study.

In the 70% of patients, reduction of pigmentation was apparent after the first peel. At the end of the third peel, 4 patients demonstrated a good response, 11 had a moderate response, and 6 showed a mild response. Two patients did not show improvement. Overall, improvement in melasma (reduction in MASI) was observed in 91% of patients ( $P<0.01$ ). Patients with epidermal type melasma demonstrated a better response to treatment than those with mixed type melasma ( $P<0.05$ ). At treatment end, one patient experienced a mild degree of treatment induced hyperpigmentation, but during follow-up no other patient developed any symptoms.<sup>8</sup> In a randomized, investigator-blind, split-face prospective trial,<sup>9,10</sup> Hispanic women with melasma were treated with 4 GA peels (either 20% or 30%) plus 4% HQ on one side of the face and 4% HQ cream alone on the other. Of the 18 patients who completed the study there was no significant difference in the degree of lightening, or difference in the MASI scores from baseline to study end, between the two groups. The physician global evaluation showed that 8 patients had more improvement on the peeled side versus 7 patients with more improvement on the nonpeeled side. Most patients felt tingling and some developed mild erythema. From this study it seems that, although GA peels may improve melasma, they are no more effective than HQ alone. However, it should be noted that these investigators recommended that more studies be done comparing the efficacy of HQ with GA peels.<sup>9</sup>

Chun *et al.*<sup>11</sup> explored the use of focal TCA, a derivative of acetic acid, peeling on dark-skinned individuals with various pigmented lesions, including melasma. There was focal application of TCA at concentrations of 10% to 50% to 20 patients with melasma. In all, 11 patients (55%) experienced good clinical response. There were no significant complications, such as persistent erythema, hyperpigmentation, herpes simplex flare up, scarring, or keloids. Mild erythema and transient PIH occurred only in rare cases. The study concluded that focal TCA peels are a safe and effective method of treating benign pigmented lesions.<sup>11</sup>

### Conclusion

Combination of hydroquinone, mometasone and tretinoin is a good option to treat melasma only when used judiciously along with sunscreen, whereas glycolic acid peels are a safer option with fewer side effects.

### References

1. Pasricha JS, Khaitan BK, Dash S. Pigmentary disorders in India. *Dermatol Clin.* 2007;25:343-52.
2. Vázquez M, Maldonado H, Benmamán C, Sánchez JL. Melasma in men: A clinical

- and histological study. *Int J Dermatol.* 1988;27:25-7.
3. Pérez M, Sánchez JL, Aguiló F. Endocrinologic profile of patients with idiopathic melasma. *J Invest Dermatol.* 1983;81:543-5.
  4. Garcia A, Fulton JE Jr. The combination of glycolic acid and hydroquinone or kojic acid for the treatment of melasma and related conditions. *Dermatol Surg.* 1996;22:443-7.
  5. Lawrence N, Cox SE, Brody HJ. Treatment of melasma with Jessner's solution versus glycolic acid: a comparison of clinical efficacy and evaluation of the predictive ability of Wood's light examination. *J Am Acad Dermatol.* 1997;36:589-93.
  6. Piamphongsant T. Treatment of melasma: a review with personal experience. *Int J Dermatol.* 1998;37:897-903.
  7. Kligman AM, Willis I. A new formula for depigmenting human skin. *Arch Dermatol.* 1975;111:40-8.
  8. Javaheri SM, Handa S, Kaur I, Kumar B. Safety and efficacy of glycolic acid facial peel in Indian women with melasma. *Int J Dermatol.* 2001;40:354-7.
  9. Hurley ME, Guevara IL, Gonzales RM, Pandya AG. Efficacy of glycolic acid peels in the treatment of melasma. *Arch Dermatol.* 2002;138:1578-82.
  10. Pathak MA, Fitzpatrick TB, Kraus EW. Usefulness of retinoic acid in the treatment of melasma. *J Am Acad Dermatol.* 1986;15:894-9.
  11. Chun EY, Lee JB, Lee KH. Focal trichloroacetic acid peel method for benign pigmented lesions in dark-skinned patients. *Dermatol Surg.* 2004;30:512-6.