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Research Article

COMPARATIVE STUDY OF SAFETY AND EFFICACY OF GLYCOLIC ACID PEEL (70%) AND TRICHLOROACETIC ACID PEEL (20%) IN MELASMA PATIENT

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A R T I C L E I N F O

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A B S T R A C T

Background: Melasma is a symmetric progressive hyperpigmentation of the facial skin. Glycolic and TCA peel are the popular peeling agents used and more commonly peeling agents for superficial and medium depth peels.
Objectives: To compare the safety and efficacy of glycolic acid (70%) and TCA peel (20%) in melasma patient.
Materials and Methods: 80 patients as per inclusion criteria attending in the skin OPDwere selected and randomly divided into 2 groups A and B, MASI score was calculated and were subjected to wood's light to determine the melasma type. The peels were applied after every 3 weeks and 6 sessions were done.
Results: There was statistically significant difference between the two peels as the percentage change in the initial and final MASI scores in Glycolic acid peel is 59% decrease and whereas it was 43% decrease in case of TCA peel.
Conclusions: Our study proves the efficacy of glycolic acid (70%) peel over TCA(20 %) in the melasma patients. Side effects especially post peel cracking and post inflammatory hyperpigmentation were more with TCA peel.

INTRODUCTION

Melasma is acommon chronic acquired refractory hyperpigmentation disorder of the face which involve the cheeks, forehead and commonly the upper lips that occurs in all races, but more commonly seen in darker skin phenotypes[1]It has a serious impact on the quality of life and is difficult to treat.[2]The condition is more commonly seen in women accounting for 90% cases.[3] It is a notorious dermatoses which is often resistant to treatment.

There are three patterns in melasma depending upon area of localization a) Centrofacial pattern involving forehead, cheeks and nose and b) Malar pattern involving cheeks and nose and c) Mandibular pattern around ramus of mandible.

On the basis of histopathological findings it can be divided in: epidermal, dermal and mixed or Epidermo-dermal type seen on Woods light examination where epidermal form is enhanced under Wood's light where the dermal form shows no enhancement.[4]

The etiology is yet to be established, but various implicating factors are sunlight, hormonal (frequent association is seen with contraceptives (estrogen plus progesterone as replacement therapy in post menopausal medications, pregnancy and endocrine dysfunction), genetic, toxic (ingredients in cosmetics) and drugs (seen in phenytoin therapy).[5]

Treatment is often a multimodality approach. Since psychological and social stress is attached to it ;it is important to counsel the patients adequately about chronicity of the disease, the importance of photoprotection and the role of hormones in persistence of the disease. As improvement of whatever degree is often limited by recurrences, hence melasma is challenging to treat even by the best of interventions. Various combination of topical medications like hydroquinone, tretinoin, topical steroids are also used for melasma along with chemical peels in the form of monotherapy or as combination therapy[3,6] The most commonly used peeling agents are alpha-hydroxy acids , resorcinol, Jessener's solution and trichloroacetic acid. [7]TCA is the most popular peeling agent used in different concentrations. It has wide spectrum of indications.[8]

Chemical peeling is one of the new tools in the therapeutic armamentarium and forms second line of management in melasma and may be helpful in improvement of its epidermal component .[9] The dermal component is handled by the ability of the peel to induce phagocytosis of stagnant melanin. However deep chemical peeling for a dermal component of melasma is not recommended in skin types IV to VI .

Chemical peeling is a procedure where a chemical agent of a defined strength is applied to the skin which causes a controlled desquamation of the layers of the skin that is followed by regeneration and remodeling; with improvement

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in the texture and surface abnormalities. The objective of chemical peeling is to cause destruction at the required depth followed by remodelling without scarring.

Glycolic acid is obtained from sugarcane and is the simplest and most used alpha-hydroxy acid peel.[10] GA is a popular peel agent because it has the smallest molecular weight amongst all alpha-hydroxy acids and penetrates skin easily.[11]

TCA (10-25%) has been used for many years as a superficial peeling agent, and is safe at lower concentrations, at higher concentrations, such as 50% and above 12, TCA has a tendency to scar formation and is less manageable than other agents used for superficial peels.

My aim for this study is to study to compare the efficacy and safety of glycolic acid peel (70%) versus trichloroacetic acid peel(20%) in melasma patient.

MATERIALS AND METHODS

The study was done in the patients attending OPD in Dermatology department between 18-40 years of age of either sex presenting primarily with complaints of melasma. A Total of 80 patients suffering from melasma as per inclusion criteria were included in the study and were allotted into 2 groups. Each of the two treatment group comprised of 40 patients.

The study was conducted for a period for a period of 1 year from march 2020 to march 2021 after getting due ethical clearance from our Institute Ethics Committee. Patients with a history of herpes, pregnant and lactating women, having open wounds and bacterial infections, viral warts or molluscum contagiosum on the area, taking photosensitive drugs, OCPs and with unrealistic expectations were excluded from the study. A written informed consent was taken from each patient before starting the study explaining about GA and TCA peel, the cost factor involved, benefits, duration of treatment, possible side effects and prognosis of treatment.

Selected participants were divided into two groups of 40 each. Group A were treated with glycolic acid 70% peel and group B was treated with TCA peel 20%.

MASI score was calculated by the following formula. To calculate MASI, the face was divided into four regions (forehead(F) 30%, right malar (MR) 30%; left malar (ML) 30%, chin(C) 10%) and each area was given a numerical value (A,0-6). The sum of severity for darkness(D,0-4) and homogeneity (H, 0-4) of melasma was multiplied by the numerical value and percentage of each area. These values were then added to obtain MASI by a single- blinded trained dermatologist.

Total MASI score: 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.Participants were strictly instructed to apply sun block cream during and after therapy along with emollients in unlimited quantities.

A detailed history was taken and clinical examination (Wood's lamp) was performed under natural light by dermatologist to select cases of epidermal and mixed melasma. MASI scores was calculated and color photographs were taken of all patients under standard conditions in natural light.

The primary objective of this study was to assess the degree of improvement in pigmentation objectively using MASI at baseline, 6 and 12 weeks. Color photographs were taken of all patients at baseline and 15 days after last peel. The patients were advised to apply 2% hydroquinone at night and to continue with topical sunscreen to maintain the results.

Peels were performed every 3 weeks for a maximum of six sessions or clearance of melasma whichever was earlier.

- For the purpose of peeling the patient face was divided into anatomic units –right forehead, left forehead, right cheek, left cheek, nose and glabella and perioral area.
- Before application of peeling agent, patient is advised to wash off the face with soap and water.
- After patting the face dry, cleansing was made with spirit and then acetone soaked sponges to remove all cutaneous oils and degrease the skin.
- The patient is asked to lie supine in semi reclining position (at an angle of 45) with eyes closed comfortably on her back.
- Coat the ala of the nose, nasolabial fold, inner and outer canthus of eyes and angle of mouth with petroleum jelly.
- The GA peel is applied with cotton wool buds applicator dipped in the required solution with mild strokes in layers starting off from the upper forehead and working the way down to mental.
- End point for Glycolic peel is erythrema and for TCA peel it is frosting.
- The patient is made to sit in front of the air condition, if required, immediately after peeling to combat the discomfort of stinging.
- The peel does not need any neutralization and patient is instructed to wash off the peel after 3-4 minutes. Post peel topical emollient and sunscreens are adviced.

RESULTS

The mean age of the patient was 32.61 years 5.11 years. All patients who were selected belonged to the age group of 20-40 years. In the study population 70 % were females while the rest were males. The ratio of female to male patient is 7:3.

In the history taking, time since the patients had melasma was asked. 46.25% of the total patients had melasma for a period of 2.5 – 5 years.

Steroid abuse was seen in 56.5 % of the patients under my study who were selected for peel treatment. Mean duration of sun exposure for 2-4 hours is seen in 43.75% of the patients. Some of the people used to work outdoors such as agricultural lands, vendors and some used to go to office.

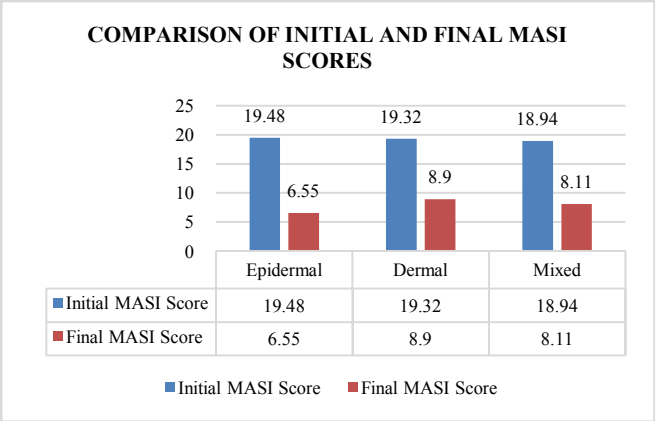
13.75% of the patients had a history of smoking while the rest were non smokers. Family history was associated in 28.75% of the patients.

All the selected patients were examined on Wood's lamp and were classified into epidermal, dermal and mixed type. Most of the patients were of mixed type(56/80) , All the patients were divided into two groups A and B . group A was treated with glycolic 70 % peel and group B was treated with TCA 20 % peel. MASI scores were taken for each of the patient before the start of the treatment and also at the end of all the sessions in both the categories. The percentage change in the initial and final MASI scores is 59% decrease. In the same way the percentage change in the mean initial and final MASI scores of

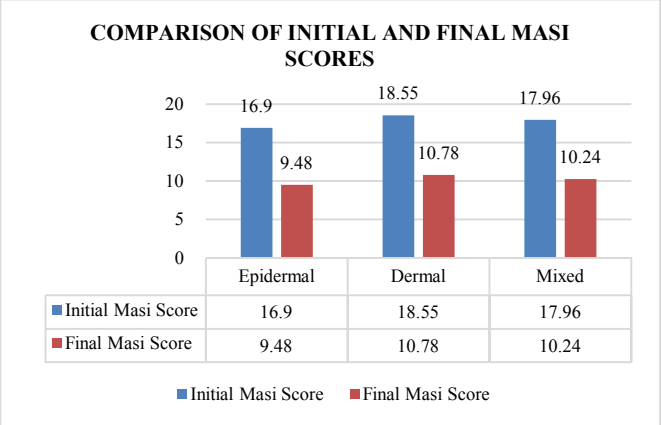
group B in which TCA 20 % peel was used is 43 % decrease. All the values came out to be statistically significant.($p<0.0001$).

In 22.5 % of the total patients melasma started after they became pregnant or during their pregnancy. All the selected patients were classified into Fitzpatrick skin type. Majority of the people (60 %) belonged to skin type IV, while 32.5 % belonged to the skin type III.

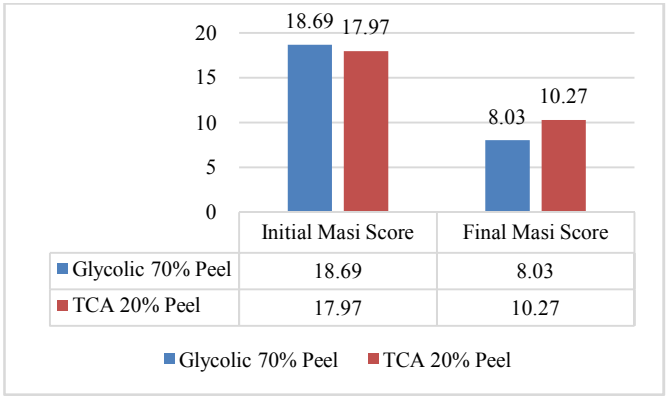
On comparing the safety profile between two peels it was found that erythrema, burning sensation and hyperpigmentation was rare overall, but it was more commonly seen in TCA 20% peel and moreover mostly on first application. On further applications the sideeffects were resolved. Post peel cracking was seen only in patients in whom TCA peel was applied. In 4 out of 40 patients it was seen . On applying chi square test, the value came out to be statistically significant. (p value= 0.040)



In the above table the change in the initial and final MASI scores in group A is given. (where glycolic 70 % is used) . The change in the value of the scores came out to be statistically significant. (p=0.001)



In the above table the change in the initial and final MASI scores in group B (TCA 20%) is given and the change in the values came out to be statistically significant. ($p <0.005$)



On comparing the percentage change in the final MASI scores from the initial scores, in both the groups; it was seen that in group A 59% and in group B 43% decrease was seen. The result was found to be statistically significant.($p < 0.005$)

DISCUSSION

Melasma is an acquired symmetric progressive hyperpigmentation of the face that is seen in almost all races but commonly seen in darker skin individuals. Melasma is associated with hormonal imbalance, solar radiation and genetic predisposition.[13]

In the study, commonest age group (50%) patients were in the age group of 10-20 years, 30% patients were between 21-30 years of age and 10% patients each were in the age group of 31-40 years and 41-50 years respectively.[14]

In my study as per inclusion criteria, 80 patients between age group of 18-40 years were taken for the study.. the mean age of the patients is 32.61 years in which majority among them (63.75%) were of the age group between 30-40 years followed by 31.25% of patients were in the age group between 25-30 years.

Melasma of all the patients were classified into epidermal, dermal and mixed type on woods lamp examination.In our study mixed type of melasma was see in majority of the patients with a proportion of 70% of the total whereas epidermal type constituted 17.5% and dermal constituted 12.50% of the total.

The MASI score was calculated for each patient at the start of the treatment of both the groups A and B and also at the end of the treatment. In group A where Glycolic 70% peel was applied the mean initial MASI scores of the epidermal variety was 19.48 which decreased to 6.55. In the mixed variety the initial MASI score was 18.94 which reduced to 8.11 after the 6 sessions of glycolic peel treatment whereas in the dermal variety of melasma the mean initial MASI score was 19.32 which reduced to 11.90, the value which reduced comparatively a bit less than other groups; the reason being since glycolic 70% peel is a medium depth peel . All the value was found to be statistically significant. (p value =0.0001)

In the group B where TCA 20% peel was used, the mean initial MASI scores of the epidermal type of melasma was 16.90 which reduced to 9.48 after 6 sessions of TCA 20 % peel application. In the mixed type the mean MASI scores decreased from 17.96 to 10.24 wheras in the dermal type of melasma the mean MASI scores reduced from 18.55 to 11.78. all the values were statistically significant.

Glycolic acid is the most commonly used peels in the treatment of melasma with concentrations varying from 35- 70 %.[15]Although a commonly used peel in lighter skin, TCA peel is less frequently used in darker skin types due to risk of scarring and post peel dyschromias.[16] The reason being frosting the endpoint of TCA peel , is not well appreciated in darker skin, and hence can lead to overtreatment.[17] When used only a low concentration of TCA (10-35%) is preferred which reaches upto upper papillary dermis.

If we compare the mean MASI scores of both the group A and B , the percentage decrease in the MASI scores in group A where glycolic 70% peel was used was 59%. Whereas in group B where TCA 20% peel was used the percentage decrease in the MASI scores came out to be 43% decrease . On applying the chisquare test the values came out to be statistically significant.

In an Indian study carried out by Kalla *et al*.[18]GA and TCA showed comparable results on subjective scores given by patients. The rate of hyperpigmentation and relapse was higher in the TCA group (25%) than GA group.

In a compasrative study on 40 indian women by kumari *et al*.[19] overall fall in MASI after six TCA peels was comparable to that observed with a similar number of 10-35% GA peels. However the TCA group complained of more severe burning as compared to GA; post peel cracking was seen in 35% patients in the TCA group and none in the GA group.

Erythrema was seen more in TCA 20% peel than glycolic 70% peel. In 40 patients of group A 3 patients had redness after application of peel which got relieved in further sessions of peel application whereas in group B, 7 patients had such erythrema.

Some patients were sensitive to the peel and they complaint of burning sensation after application of peel. Here also this complaint was seen more in group B patients who were applied TCA peel. in group B; 5 patients had such complaint whereas in group A only 2 patients complaint of burning sensation. However the result is not statistically significant.

Hyperpigmentation was also seen in TCA 20 % peel than glycolic 70 % peel where it was seen in 4 cases whereas it was seen in 1 cases in group A category where glycolic 70% peel was applied Some patients do complain about post peel cracking which was seen after 5-6 days of peel application. This effect was only seen in group B patients .10 % patients observed post peel cracking in TCA20 % peel category. The value is statistically significant where p value is 0.04.

It was found that TCA peel caused more discomfort, slight burning sensation and excessive desquamation during the next 4-5 days. The glycolic acid procedure was associated with immediate stinging and burning that was more pronounced at first visit.

CONCLUSION

Our study proved the efficacy of glycolic acid 70 % peel over TCA 20% in the melasma patients, however it was found that there was also a significant decrease in the MASI scores in TCA 20 % peel. There was overall improvement noted in the hyperpigmentation of melasma as documented by the photography and scoring systems (MASI).

Side effects especially post peel cracking and post inflammatory hyperpigmentation were more with TCA peel. The procedure is safe, affordable and mostly free of side effects. It can be easily preferred option for achieving good results.

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