

Comparison of 30% Salicylic Acid with Jessner's Solution for Superficial Chemical Peeling in Epidermal Melasma

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ABSTRACT

Objective: To compare the efficacy and safety of Jessner's solution with 30% salicylic acid as superficial chemical peeling agents in treating epidermal melasma in Asian skin.

Study Design: Double blind, randomized, interventional comparative study.

Place and Duration of Study: Department of Dermatology, Combined Military Hospital, Malir Cantt, Karachi, from January to December 2004.

Patients and Methods: Sixty consenting patients with epidermal melasma were randomly divided into two groups. Group A was treated with Jessner's solution and Group B with 30% salicylic acid. Baseline Melasma Area Severity Index (MASI) score was noted and peeling started at 2-weekly intervals. Sunscreen in morning and moisturizer at night were prescribed in all patients. MASI score and adverse effects were recorded biweekly. Treatment was stopped at 12 weeks and patients were followed-up at 4 weekly intervals for further 12 weeks. Final MASI score and adverse effects were noted at the end of follow-up period. Mean MASI scores were compared using paired sample t-test and one-way ANOVA.

Results: Difference in baseline, treatment end and follow-up end MASI scores was not statistically significant between the two groups (p 0.54, 0.26, and 0.55 respectively). On the other hand, within group analysis of difference between pre and posttreatment MASI score was highly significant in both groups (p < 0.0001). Adverse effects were mild and comparable in both groups.

Conclusion: Jessner's solution and 30% salicylic acid are equally effective and safe peeling agents for use in epidermal melasma in Asian skin.

Key words: Superficial chemical peeling agent. Epidermal melasma. Salicylic acid. Jessner's solution.

INTRODUCTION

Chemical peels are one of the most frequently performed aesthetic procedures in North America and superficial chemical peels have recently been shown to be effective in Asian skin as well in a variety of conditions.¹

Melasma, one of the common aesthetically displeasing entities, continues to be a difficult problem to treat.² Different topical depigmenting agents have been used alone or in combination with varying results but no agent has proved to be ideal.^{2,3} Superficial chemical peeling as a treatment modality in epidermal melasma is a new weapon in the therapeutic armamentarium.⁴

Salicylic acid is among the commonest and most successful superficial chemical peeling agents used in

epidermal melasma.^{5,6} It has keratolytic, comedolytic and anti-inflammatory properties. It solubilizes intercellular cement, reduces corneocytes adhesion, and sloughs off the superficial layers of skin. Although, the literature is replete with the use of alpha hydroxy acids as peeling agents, there is a dearth of published data regarding the efficacy and safety of salicylic acid peels in Asian skin.^{7,8}

Jessner's peel is a combination of salicylic acid 14%, lactic acid 14%, and resorcinol 14% in alcohol. Jessner's solution has been in use for over 100 years and thus has an extremely long history of safety and efficacy.⁹ Traditionally, it has been used as a penetration enhancing agent, by sloughing off the keratin layer, in combination with 35% trichloroacetic acid for medium depth chemical peeling. Recently, it has been shown to be an effective superficial chemical peeling agent when used alone. However, few studies have compared it with other superficial peeling agents.¹⁰⁻¹³

This study was conducted to compare the efficacy and safety of two promising chemical peeling agents, Jessner's solution with 30% salicylic acid in the treatment of melasma.

PATIENTS AND METHODS

A randomized, double blind therapeutic trial was undertaken at the Dermatology Department of

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Combined Military Hospital, Malir Cantt., Karachi, from January to December 2004. The medical ethics and scientific committee of the hospital approved the study.

Consenting patients with epidermal melasma, as assessed by Wood's lamp examination, were included in the study. Patients unable to avoid excessive daytime outdoor activities, pregnant and lactating women, those having history of liver disease and using of contraceptive pills or hormonal therapy and those taking systemic medicines or applying topical agents for the treatment of melasma were excluded from the study. All selected patients were clearly advised not to apply cosmetics or any other topical application during the study period.

After carefully evaluating the exclusion criteria, patients were randomly assigned to either group A or group B. Randomization was done by simple randomization method using random number table. Patients in group A were treated with Jessner's solution and those in group B were treated with 30% salicylic acid. After two weeks of priming, which comprised nightly application of 0.05% tretinoin and daytime sunscreen with a sun protection factor of 60, treatment according to the group was started. Night-time use of moisturizer was prescribed in all patients. Retin A cream, peeling solutions, and moisturizer were provided by the institution whereas sunblock 60 was purchased by the patients. At each visit, patients were asked to bring used medicine to check compliance. Patients were blinded to the peeling agent being used on them but it was not possible to blind the investigator due to different colours of the peeling agents. However, the investigator responsible for Melasma Area Severity Index (MASI) scoring was blinded to the treatment.

Baseline MASI score was noted and patients were called at 2 weekly intervals for chemical peeling. The face was first cleansed with methylated spirit to defat the skin. A thin layer of acetone was then applied with a cotton swab to enable uniform distribution of peeling solution. Using cotton tipped sticks, the assigned solution was applied in a thin layer for one minute till even frosting occurred. The solution was left for 5 minutes and then washed with water. The patients were advised strict sun protection with use of sunblock cream before venturing outdoors. The duration of action of sunscreen was fully explained to the patients. Patients were called after every 2 weeks to document the MASI score for assessment and repeat procedure. At the end of 12 weeks, procedure was stopped and final MASI score was noted. Patients then entered a 12 weeks follow-up period during which the sunscreen in morning was continued. Patients were examined at 4 weekly intervals during this period and MASI scores were noted. At the end of follow-up period, MASI score was checked again and final entry was made and compared with the baseline MASI.

The statistical analysis was done using computer

programme SPSS version 11.0. Frequencies and percentages for the variables were reported. Significance was tested at a level of 0.05 using chi-square test, two sided paired sample student's t-test and one-way ANOVA.

RESULTS

Demographic profile and clinical characteristics of the patients are shown in Table I. Out of 60 patients, who entered the study, 7 (11.7%) were males and 53 (88.3%) were females. Age ranged from 17 to 44 years (mean 30.4 years, SD \pm 5.8, chi-square, $p=$ 0.15). Group A (Jessner's solution) included 34 (56.7%, mean age 28.1 years) patients, while group B (30% salicylic acid) included 26 (43.3%, mean age 32.4 years) patients. Skin type-5 was the most commonly encountered condition ($n=47$, 78.3%) while skin type-3 was the least common ($n=2$, 3.3%). Skin types 1 and 2 were not seen. Majority of the patients were housewives who did not give history of excessive sun exposure.

Table I: Demographic profile, co-variates and clinical features.

Variable	Group A (Jessner's solution)	Group B (30 % Salicylic acid)
Patient number		
Baseline	34	26
Treatment end	32	25
Follow-up at 4 weeks	29	25
Follow-up at 12 weeks	21	20
Sex		
Male	5 (14.7%)	2 (7.6%)
Female	29 (85.2%)	24 (92.3%)
Marital status		
Married	27 (79.4%)	23 (88.4%)
Unmarried	7 (20.5%)	3 (11.5%)
Occupation		
Housewives	28 (82.3%)	24 (92.3%)
Indoor	2 (5.8)	
Outdoor	4 (11.7%)	2 (7.6%)
Skin type		
3	-	2 (7.6%)
4	8 (23.5%)	3 (11.5%)
5	26 (76.4%)	21 (80.7%)
Complications		
Excessive crusting	8 (23.5%)	4 (15.3%)
Sunburn	-	2 (7.6%)
Pigmentation	-	2 (7.6%)
Acneiform eruption	-	2 (7.6%)

At the end of treatment period, there were 2 (5.8%) dropouts in group A and 1 (3.8%) in group B, whereas at the end of follow-up period at 4 weeks, there were 8 (25%) dropouts in group A and 6 (24%) in group B. Three dropouts during the treatment period were all housewives and they were stopped from getting further treatment by their husbands due to crusting. Rest of the dropouts were lost to follow-up.

Between groups, statistical analysis was not significant as shown in Table II and the null hypothesis could not

Table II: Statistical analyses and group comparison. Significance tested by one-way ANOVA (*p*-value considered significant at 0.05).

Variable	Group A			Group B			Between groups p-value	F=value
	Mean	Standard deviation	Standard error	Mean	Standard deviation	Standard error		
Pretreatment MASI score	6.5	3.84	0.65	5.9	3.11	0.61	.54	0.37
12 weeks MASI score	2.9	3.03	0.53	2.1	2.63	0.52	.26	1.27
Follow-up MASI score at 12 weeks	3.5	3.17	0.76	3.2	3.07	0.74	.55	0.36

be rejected. Within groups analysis at the end of treatment period and at the end of 4 and 12 weeks follow-up period was highly significant in both groups ($p < 0.0001$, $t = 8.28, 6.36,$ and 4.11 respectively, paired sample t-test).

No new adverse effects were observed. The adverse effects given in Table I have all been previously reported and were not severe enough to stop treatment in any patient.¹⁰

DISCUSSION

Jessner's solution has traditionally been used for medium depth peels in combination with other peeling agents.¹⁴ Recently, it has been rediscovered as a superficial peeling agent with good results when used alone.¹⁵ There are no reported therapeutic trials on Jessner's solution as a peeling agent in Pakistani literature. Several reports of efficacy of Jessner's solution in melasma are found in international literature but no comparison of Jessner's and salicylic acid could be found.^{16,17}

The use of 30% salicylic acid as a peeling agent has been studied on dark skin in the literature and largely compared with glycolic acid, but could not find any comparison with Jessner's solution.¹⁸⁻²⁰ Efficacy and safety of 30% salicylic acid, as shown in this study corroborates earlier findings in studies mentioned above and in others.²¹ Both peeling agents were prepared in the institute's pharmacy on weight-to-volume basis in a hydroethanolic solution. Both agents were equally effective but 30% salicylic acid is more practical to use. Preparation of Jessner's solution is a bit more tedious as it has to be freshly prepared and kept in amber coloured bottle since it degenerates rapidly.

Quantitative analysis of improvement in melasma is difficult. Mostly, MASI score is used for this purpose. Melasma Area Severity Index (MASI) was developed by Kimbrough-Green *et al.* for the assessment of melasma.²² The severity of melasma in each of the four regions (forehead, right malar region, left malar region and chin) is assessed based on three variables: percentage of the total area involved (A), darkness (D), and homogeneity (H). Clearly, it can be seen that grading of darkness and homogeneity are subjective in nature. That problem was sorted by blinding the investigator to the treatment modality being used but nevertheless, however, bias can still exist. Newer and

better modalities have been developed like mexameter, which provides objective measurement of melanin based on absorption spectra of light and UV photography.²³ Use of these analyzing instruments can help in better patient evaluation in future studies.

Patient population in this study shows a definite bias towards females. Whereas, melasma is commoner in females, they were in a disproportionately high number in the study. As the study was conducted in military hospital environment and soldiers have a more than usual exposure to sunlight, most males with melasma either declined to undergo the treatment or were not found suitable candidates. Nevertheless, the results did not show any difference in response based on gender.

Priming has a role in minimizing postpeeling hyperpigmentation. Two percent hydroquinone and 0.025% tretinoin have both been advocated.²⁴ Others have not found any benefit of priming with tretinoin.²¹

Authors preferred to do priming with 0.05% tretinoin cream based on guidelines on salicylic acid peels in darker skin types,⁷ and to standardize the two groups. Incidentally, as priming has not been done before in Jessner's solution peel, this study⁹ gives baseline data of effects of priming before Jessner's peels in darker skin types.

The myth of adverse effects with superficial peeling in darker skin types has already been broken. It has been shown and established that superficial chemical peeling procedure is safe in darker skin types.^{6,7,11,13,23} The results are not different from previous studies. Results are more or less comparable in the two groups. There were some transient effects only, most of which settled during treatment and follow-up period. However, patient selection and their education before start of the procedure are of paramount importance. Adverse effects, though transient can horrify the patient and close relatives. Photographic evidence of previous patients may be helpful and reassuring for the patients.

The present study had its limitations. Number of patients in the two groups was small. Larger, preferably multicentre trials are needed to further confirm these findings. Furthermore, follow-up period is also short. Melasma is known to relapse. Longer follow-up studies are needed to establish recurrences in treated patients. In spite of all the limitations, being the first comparative trial on Jessner's solution in Pakistan, it should be regarded as a pilot project paving the way for further research in this direction.

CONCLUSION

Jessner's solution and 30% salicylic acid solution are equally effective and safe in the treatment of melasma in skin types 3, 4, and 5.

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