

Salicylic acid chemical peels as therapeutic modality in treatment of melasma in comparison to Jessner's solution peel

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Abstract

Background and objectives: Many chemicals have been used in the skin peeling for melasma such as Jessner's solution, trichloroacetic acid, glycolic acid, lactic acid and salicylic acid which is beta-hydroxy acid used topically in different dermatoses. This study was done to investigate the efficacy and safety of superficial chemical peel with salicylic acid in treatment of melasma in comparison to Jessner's solution peel.

Method: forty-eight cases with melasma, were divided into group-A and group-B. Treatment is performed by using superficial chemical peel with salicylic acid solution (30%) once every 2 weeks in group -A while Jessner's solution peel used in group -B

Results: Most of the patients in both groups showed significant improvement in their melasma with the use of treatment and adequate sun protection as assessed by clinical appearance and MASI scores (Melasma Area and Severity Index), the results was better in group-A

Conclusion: Superficial chemical peel with salicylic acid for melasma is an easy, cheap and effective treatment in comparison to Jessner's solution peel. Results were much better in epidermal type with few side effects.

Keywords: salicylic acid, melasma, superficial chemical peel, Jessner's solution peel

Introduction

Melasma is a common medical and esthetic problem, especially in dark-skinned people. It is an acquired irregular brown or sometimes grey-brown hypermelanosis, which affects areas of sun exposure.¹ The condition is seen most commonly on the face of women with skin types IV to VI, especially among those living in areas of intense UV radiation, family history was found in most of the cases. The marks appear at the end or beginning of the second decade of life, though in black patients they may appear later.² On the basis of Wood's light examination (365 nm), melasma can be classified to three types: Epidermal type, dermal type and mixed type.³ At present there is no universally effective agent for the treatment of melasma. There are however, various

therapeutic modalities that can offer significant results.⁴ Treatment is aimed at reducing the increased pigmentation that develops in melasma. This includes: General measures (mostly sunscreen), topical depigmenting agents, chemical peels (Superficial, medium and deep), laser therapy, cryotherapy and dermabrasion⁽⁵⁾. Superficial chemical peeling (SCP) involves the application of a peeling agent to the skin, resulting in the destruction of all of the epidermis and sometimes reaching superficial dermis.⁶ The most commonly used SCP agents are glycolic acid 20-70%, trichloroacetic acid 10-25%, Jessner's solution, salicylic acid, pyruvic acid, resorcinol 30-50% preparations, and solid carbon dioxide.⁷ Salicylic acid (ortho-hydroxybenzoic acid) is a beta-hydroxy acid agent, it is one of the peeling agents being used nowadays for the treatment of

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various facial disorders like lentigines, pigmented keratoses, actinical damaged skin of the dorsal hands and forearms and acne vulgaris.⁸ It is a lipophilic compound which removes intercellular lipids that are covalently linked to the cornified envelope surrounding cornified epithelioid cells.⁹ Due to its anti-hyperplastic effects on the epidermis multiple investigators have used salicylic acid as a peeling agent.¹⁰ A variety of formulations of salicylic acid has been used as peeling agents in different concentrations. In concentrations of 20% to 30%, salicylic acid is used for the treatment of acne and mild photoaging. It is also used in combination with other agents as part of Jessner's solution.¹¹ In general, there are few contraindications of salicylic acid chemical peel like Salicylate hypersensitivity, active inflammation/dermatitis, infection at the salicylic acid peeling site, acute viral infection, Pregnancy, isotretinoin therapy within 3–6 months of the peeling procedure and the Side effects of salicylic acid peeling are mild and transient like Prolonged erythema that lasted more than 2 days, dryness, intense exfoliation and Crusting.¹² Jessner's Solution has been used for over 100 - years as a therapeutic agent to treat hyperkeratotic epidermal lesions but the main indications of Jessner's solution is acne, melasma, post-inflammatory hyperpigmentation, lentigines, freckles and photodamage.¹³ The purpose of the present work is to investigate the efficacy and safety of superficial chemical peel with salicylic acid in treatment of melasma in comparison to Jessner's solution peel.

Method

All patients gave written informed consent before any study-related procedures were performed. Forty-eight patients were enrolled in this randomized open-label clinical trial with different types of melasma and with Fitzpatrick's skin types III, IV and V. Patients were eligible for this study if they had melasma for more than one year, with the history of multiple previous therapies for melasma and they were excluded if they

had Pregnancy, or history of keloid tendency, history of recurrent herpes simplex, history of systemic retinoid e. g. isotretinoin intake during last six months, history of chemical peeling or any other surgical procedures on the face during last six months and Patients with psychological problems which may lead to non compliance. Each patient has been interviewed and full history was taken with emphasis on the progress of melasma, previous and present medications for melasma as well as history of contraceptive pills, daily sun exposure history of pregnancy and family history.

The patients have been divided into two groups (group A =24 patient, group B =24 patient) The procedure was fully described to each patient including its duration which lasting maximum of 8 weeks in which four peeling sessions will be done once every 2 weeks, also they were informed about the side effects that he or she may had and Patients should keep themselves away from sun exposure especially during the course of chemical peeling.

Photographs for each patient in both groups have been taken as a baseline before starting peeling then every 2 weeks, till the last photo has been taken 2 weeks after the last session. All photographs were taken by using a Sony-Digital camera (Model DSC-W55, SONY, 7.2 mega pixels). **Woods' light** was done to differentiate between melasma types; epidermal, dermal and mixed. **MASI scoring system** (Melasma Area and Severity Index): Melasma severity was scored before and after each session by using MASI score (It is an index used to quantify the severity of melasma and changes during therapy). According to the MASI score, the face can be divided into four areas: **F**, forehead (30%); **MR**; right malar (30%); **ML**; left malar (30%); **C**, chin area (10%). In each of these areas, melasma is graded on: **A**, **percentage of total area involved** (0: no involvement, to 6: 90–100% involvement) **D**; **darkness**; (0: absent, to 4: maximum) **H**; **homogeneity of hyperpig-**

mentation (0: minimal, to 4: maximum) MASI is then calculated by the following formula: 30% (DF + HF) AF + 30% (DMR + HMR) AMR + 30% (DML + HML) AML + 10% (DC + HC) AC. The maximum value of MASI is 48 and means severe hyperpigmentation⁽³⁾.

Clinical Appearance score system:

Three independent investigators through the evaluation of serial photography and the clinical response and the rating score were as follows: No response (0%) minimal response, (1-25%), mild response (26-50%), Moderate response (51-75%). Significant response (Greater than 75%). After cleaning face with soap and water for removing debris and make-up cleansing and degreasing are done by using a cotton ball soaked with 25% acetone. The process repeat several times.

Group –A (salicylic acid solution group):

The patients were treated with 30% salicylic acid solution (by mixing 30gm of salicylic acid powder into 100 ml of absolute ethyl alcohol). After cleansing and degreasing the face, the patient was lying comfortably on her or his back, nasolabial areas covered by Vaseline, after that peeling was done with stick cotton applicator dipped in required solution with smooth strokes to the affected areas. Application was completed within 30 seconds, then after the appearance of the white precipitate (1-3 minutes), termination was done by cleaning face with cold water but without rubbing, as salicylic acid doesn't need neutralization, only cold water was enough. Patients were advised to avoid washing face with soap at least for next 24 hours, with continuous advice to avoid of sun exposure and apply sun screen at daytime after peeling. This is done every 2 weeks till got a result that satisfied the patient or up to 4 sessions.

Group –B (Jessner's solution group)

This group were treated by Jessner's solution [it consist of resorcinol (14 g), Salicylic acid (14 g), Lactic acid (14g or 85%) into Ethanol (95% in Sufficient quantity to make 100 ml)]. The solution is applied by gently painting onto the skin and can be layered

Repeated coats are applied until the white frost develops or until the stinging becomes unbearable, after which one should continue to fan the face for several minutes until the pain sensation fades. After that, cool water will be used for neutralization and removal purposes. This is done every 2 weeks till got a result that satisfied the patient or up to 4 sessions.

Post peeling instructions: Instruction's leaflet which specifies the date for next visit and for the patient's follow up was given to all patients. Patients were instructed to avoid as much as possible sun exposure for at least during the course of treatment and were encouraged to use physical sun screen during daytime and moisturizer agent at night to prevent dryness. Patients who complained from discomfort like itching, redness and exfoliation of the face were given fusicort skin cream to be applied twice daily.

Follow-up evaluation of patients was done regularly at 2 weeks intervals after peeling sessions. At each visit changes in clinical appearance were assessed, MASI score was assessed and photographs of right, left profiles and full face were taken for each patient to assess the improvement of lesions.

Statistical analysis: Statistical package for social science (SPSS) program version 13 was used for statistical analysis -Before starting therapy a baseline assessment was done as well as calculation of melasma area severity index (MASI scoring). Statistical analyses were used in all parameters. P- values of less than 0.05 were considered significant.

Results

A total of 48 cases (42 females and 6 males) with melasma included in our study. Their ages ranged between 18 and 50 years. They were having Fitzpatrick's skin types III, IV and V.

I. Group – A (salicylic acid solution group):

This group include 24 patients (20 female +4 male) among which 17 (70.8%) patient had given family history of melasma, 7(29.2%) had no family history. Eleven (55%) patients were married and 9 (45%) were unmarried, among

married females 6 (54.5%) gave history of pregnancy. Regarding drug history which is considered as a common cause of melasma, contraceptive pills were used by 7 (35%) patients and were not taken by 13 (65%) patients. Nine (37.5%) patients had Fitzpatrick's skin type III, and 12(50%) had skin type IV and 3 (12.5%) skin type V. Ten (41.7%) patients were sunscreen users and 14 (58.3%) of them non users. Indoor workers were 17(70.83%) and only 7(29.17%) were outdoor workers. Fifteen (62.5%) of patients had epidermal type of melasma based on Wood's light examination, 3 (12.5%) patients had dermal type and 6(25%) mixed type. Thirteen (54.2%) patients completed four sessions, 7(29.1%) patients had completed three sessions and,4(16.7%)patients had completed two sessions only.

The changes in mean of MASI score in group B (figure -2) : In the epidermal type; mean MASI score was 20.36 before peeling and became 18.59 after the first session, 16.21 after the second session, 12.01 after the third session and 7.63 after the fourth peeling, so the difference was 12.73 (62.52 %) and was statistically significant (p value<0.05).

In the mixed type; mean MASI score before peeling was 22.51 became 21.38 after the first peeling, 18.82% after the second peel, 14.36 after the third peeling and 11.06 after the fourth peeling. So the difference is 11.45 (50.86%) and p- value is significant.

In dermal type, mean MASI score before peeling was 19.4, became 19.4after the first peeling, 19.4% after the second peel, 19.4 after the third peeling and 18.31 after the fourth peeling. So the difference in mean score was 1.09 (5.62%). p- Value is not significant.

In general for **total** number of cases the mean difference was 8.45 (40.72%) ,so the p- value is statistically significant

The clinical response in group B (Jessner's solution group);

In epidermal type of melasma, 7(50%) showed mild response, 4(28.6%) showed moderate response and 3(21.4%) had significant response, patients with **mixed type** of melasma 1(12.5%) showed mild response, 4(50%) showed moderate and 3(37.5%) had got significant response. **In dermal type;**1(50%) minimal and 1(50%) had moderate response.

Regarding the difference in mean MASI score and skin types and melasma types: The difference was statistically significant in skin type V only. Regarding melasma types the

mean difference was 10.34 which is statistically significant (p -value <0.001).**Side effects;** Most of the adverse reactions that occurred were already like group A, the erythema appeared in patients of this group was mild and associated with slight desquamation. Transient postinflammatory hyperpigmentation occurred in 5(20.83 %) patients.

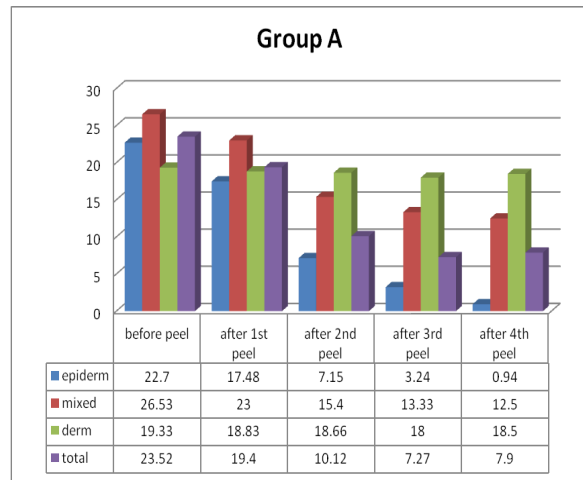


Figure 1: changes expressed on MASI score after each peel in different types of melasma in Group -A

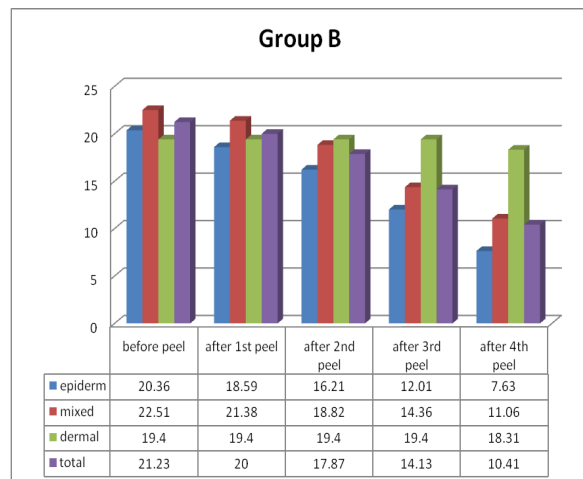


Figure 2: changes expressed on MASI score after each peel in different types of melasma in Group-B



Figure 3: A 25 years old female with epidermal type of melasma:
a: Before treatment,b: After 2 session with salicylic acid chemical peel

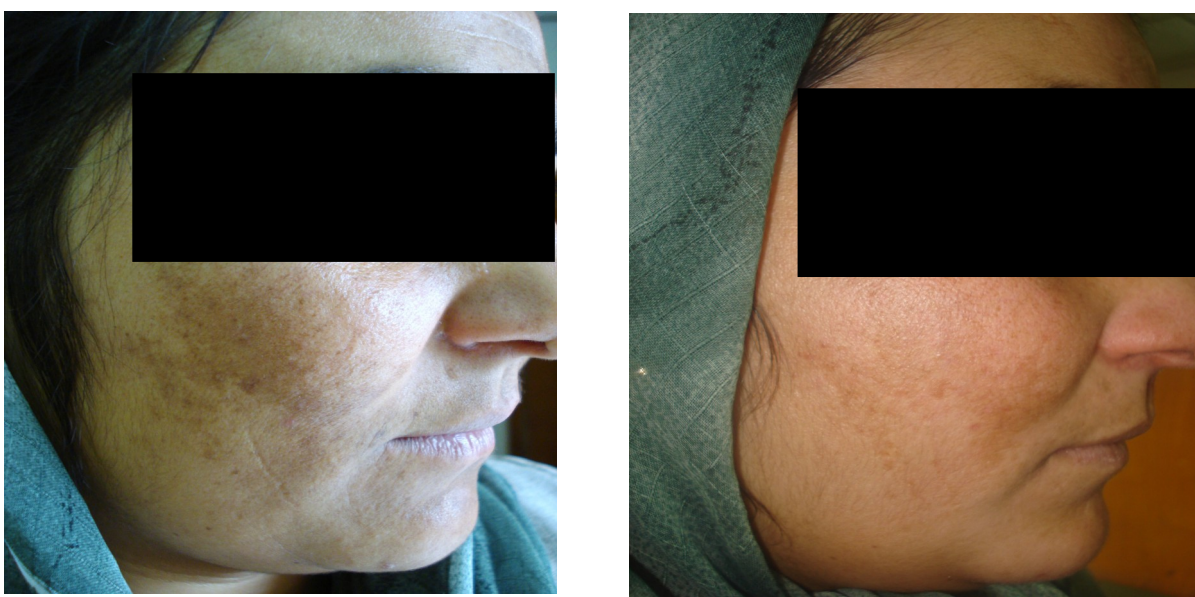


Figure 4: A 26 years old female with skin type IV had mixed type of melasma
A:Before treatment,B: After 3 session, with salicylic acid chemical peel.

**Figure: 5**

A 28 years old female with skin type IV had epidermal type of melasma:
a: Before treatment,b: after 3 session, with salicylic acid chemical peel

DISCUSSION:

In this open –label comparative trial of chemical peels for patients with different types of melasma, superficial chemical peel with salicylic acid treatment for up to 8(4 session) weeks resulted statistically and clinically significant improvement in melasma. Melasma in people with higher skin phototype are usually resistant to therapy and therapeutic results are unsatisfactory¹⁴, however our patient's skin type was mostly type IV and we obtained good response this is may be due to the properties of salicylic acid as superficial type of chemical peel and it is less irritating than other types of superficial chemical peels . After a total of four peels a significant decrease in mean of MASI values was established in both groups especially in the epidermal type (p-value < 0.05). This is expected with different modalities of treatment.¹⁵ The patients in group – A with epidermal type of melasma showed better response to salicylic acid peels than group-B patients and this is similar with different types of superficial chemical peels in other studies.¹⁴ The patients in group-A tolerated the procedure of salicylic acid peeling and most of the adverse reactions that occurred

were already expected from such treatment and these did not affect compliance of the patients.¹⁵ However in current study, the patient's experienced burning irritation, occasional stinging and pain just after application and this disappeared after few minutes at the end of procedure. There was slight desquamation two to three days after peeling, mostly over cheeks which were efficiently controlled with twice application of fucicort cream for a day or two and dryness was managed with local application of emulsifying ointment. Erythema was not severe as salicylic acid has anti-inflammatory and anesthetic properties.¹⁶ Post-inflammatory hyperpigmentation appeared in three patients of Fitzpatrick's skin type IV in group –A and 5 patients in group-B and this complication disappear after 6 weeks. Different types of Chemical peeling techniques were used for treatment of melasma especially in Iraq¹⁷ but the Superficial chemical peel with 30% salicylic acid is an effective method of treatment for melasma especially for epidermal type but less effective in mixed and with no good result in dermal type in comparison to Jessner's solution peel. It is easily performed, well tolerated by the patients

Especially in dark skin people and it is a cheap method of treatment with very limited and transient side effects.

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