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

Ali Mozan Dhahir elethawi *

Abstract

Background and objectives: Many chemicals have been used in the skin peeling for melasma such as Jessner’s solution, trichloracetic 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. 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. On the basis of Wood’s light examination (365 nm), melasma can be classified to three types: Epidermal type, dermal type and mixed type. At present there is no universally effective agent for the treatment of melasma. There are however, various therapeutic modalities that can offer significant results. 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. 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. The most commonly used SCP agents are glycolic acid 20-70%, trichloracetic acid 10-25%, Jessner’s solution, salicylic acid, pyruvic acid, resocinol 30-50% preparations, and solid carbon dioxide. 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...
various facial disorders like lentigines, pigmented keratoses, actinial damaged skin of the dorsal hands and forearms and acne vulgaris. It is a lipophilic compound which removes intercellular lipids that are covalently linked to the cornified envelope surrounding cornified epithelioid cells. Due to its anti-hyperplastic effects on the epidermis multiple investigators have used salicylic acid as a peeling agent. 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 apart of jessner's solution. 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.

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. 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 randomize 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 hyperpigmentations ;
Mentionation (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%).

Post peeling instructions:

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.

Group – A (salicylic acid solution group):
This group include 24 patients (20 female and 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 peeling, 16.21 after the second session, 12.01 after the third session and 7.63 after the fourth peeling, so the difference was12.73 (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 19.4 after 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 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.
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 unsatisfactory, 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. 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. 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. 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. 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 Iraq 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.

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

References

1. Kang WH, Yoon KH, Lee E-S, Kim J, Lee KB, Yim H and Sohn S. Melasma: histopathological characteristic in 56 korean patients. Br J Dermatol 2002; 146-228-37
2. Pandya AG and Guevara IL. Disorders of hyperpigmentation. Dermatol Clin 2000; 18: 91–98.
3. Zeinab Tosson, Enayat Attwa and Sahar Al-Mokadem.: Pyruvic acid as a new therapeutic peeling agent in acne, melasma and warts. Egyptian Dermatology Online Journal 2 (2): 7, December 2006
4. Grimes PE. Melasma. Etiologic and therapeutic considerations. Arch Dermatol 1995; 131.
5. Aditya K. Gupta, Melissa D. Gover, BSc. The treatment of melasma: A review of clinical trials. J Am Acad Dermatol 2006; 55:1048.
6. A. Katsambas and Ch. Antoniou. Melasma: Classification and treatment. Journal of the European Academy of Dermatology and Venereology 4.; 1995: 217-223
7. Zakopoulou, N; Kontochristopoulos, G. Superficial chemical peels. Journal of Cosmetic Dermatology 2006. pp. 246-253(8)
8. Lee HS and Kim IH. Salicylic acid peels for the treatment of acne vulgaris in Asian patients. Dermatol Surg. 2003;29: 1196–1199.
9. Lazalo ND, Meine JG and Downing DT. Lipids are covalently attached to rigid corneocyte protein envelope existing predominantly as beta-sheets: a solid state nuclear magnetic resonance study. J Invest Dermatol. 1995;105: 296–300
10. Glogau RG and Matrasso SL. Chemical peels. Dermatol Clinic 1995; 13:263.
11. Kligman D and Kligman AM. Salicylic acid peels for the treatment of photoaging. Dermatol Surg. 1998; 24: 325–328
12. Thiers BH and Peron G. JR. Complications related to chemical peeling. Mosby Year Book, 2002; 29:487
13. Monheit GD. Jessner’s + TCA peel: A medium depth chemical peel. J Dermatol Surg Oncol1989; 15: 945–950
14. S. Valkova. Treatment of melasma with glycolic versus Trichloroacetic acid peel: comparison clinical efficacy. Annual Proceedings IMAB Volume 1; 2004; 41
15. Arfan ul Bari, Zafar Iqbal and Simeen ber Rahman. Superficial chemical peeling with salicylic acid in facial dermatoses. JCPSP 2007, Vol. 17 (4): 187-190
16. Sakar r, Kaur C, bhalla M and Kanwar AJ. The combination of glycolic acid peels with a regimen in treatment of melasma in dark skinned patients, a comparative study. Dermatol Surg 2002; 28:828-32
17. Sharquie.K.E, Al-Tikreety M.M and Al-Mashhadani S.A. Lactic Acid Chemical Peels as a New Therapeutic Modality in Melasma in Comparison to Jessner’s Solution Chemical Peels Dermatol Surg 2006;32:1429–1436.
10. Barkin R., editor. Problem Oriented Pediatric Diagnosis. 2nd edition. Philadelphia: Lippincott Williams & Wilkins. 2001. P 23.
11. Eriksson M, Bennet R, Rotzen-Ostlund M, von Sydow M, Wirgart B Z. Population-based rates of severe respiratory syncytial virus infection in children with and without risk factors, and outcome in a tertiary care setting. Acta Paediatr. 2002; 91: 593–598
12. Alnajjar S., Alrabaty A., Alhatem I. Chest X-ray in suspected pneumonia in pediatrics, clinic-radiological study. Hawler: Hawler medical university. 2007
13. Sachdev H., Vasanthi B., Satyanarayana B., Puri R. Simple predictors to differentiate acute asthma from ARI in children: implications for refining case 14. Korppi M, Heiskanen-Kosma T, Leinonen M. White blood cells, C-reactive protein and erythrocyte sedimentation rate in pneumococcal pneumonia in children. Eur Respir J. 1997 May;10(5):1125-9.