EFFICACY AND SAFETY OF SALICYLIC ACID AS SUPERFICIAL CHEMICAL PEELING AGENT IN THE TREATMENT OF MELASMA

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ABSTRACT

Introduction: Melasma is common, acquired hyper pigmentation of sun exposed areas of face and neck. The disease is more common in people with dark complexion. It occurs specially in women.

Objective: The objective of the study is to determine the efficacy and safety of salicylic acid as superficial chemical peeling agent in the treatment of epidermal melasma.

Material And Methods:

Setting: Dermatology Unit Lady Reading Hospital, Peshawar.

Study Design: Quasi experimental study.

Duration: Six months (November 2009 to April 2010).

Sampling Technique: Purposive; non-probability sampling.

Results: Mean age was 40 years where as SD ± 28.42. Seventy five percent patients were female and 25% patients were male. The type of skin was analyzed as 40(60%) patients had photo type IV type of skin and n=20(40%) patients had photo type V type of skin. The mean MASI score at base line was 15.68 (range 5.6 to 27.6). MASI was reduced to 5.78 (range 3.8 to 13. 78) at end of six peeling sessions. MASI represents 63.13% improvement in base line MASI score. The mean MASI score at end of 1 month follow up period was 4.12 (range 3.12 to 11.90). It represents a 73% improvement in base line mean MASI score.

Conclusion: Superficial chemical peeling with salicylic acid is an effective and safe treatment modality for the treatment of epidermal melasma.

Key Words: Superficial chemical peeling, Salicylic acid, Facial dermatosis

INTRODUCTION

Melasma is common, acquired hyper pigmentation of sun exposed areas of face and neck. The disease is more common in people with dark complexion. It occurs specially in women. Melasma is strongly associated with pregnancy, oral contraceptives pills and exposure to ultra violet radiation, thyroid dysfunction and positive family links.[1] Melasma can be divided into three types based on wood's lamp examination i.e. epidermal, dermo-epidermal (mixed) and dermal. On wood's light examination epidermal & mixed types shows accentuation of pigmentation, while there is no change in dermal type. Conventional therapy for melasma consists of hydroquinone, retinoic acid, azelaic acid and topical steroids.[2] The efficacy of therapies is limited as melasma is refractory to treatment. Chemical peeling has become an established technique for the treatment of melasma.[3]

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Salicylic acid (Beta hydroxyl acid) is one of the superficial peeling agents used to treat melasma. It affects superficial layers of skin thus carry lowest risk of adverse reactions.[1]

MATERIAL AND METHODS

SETTING: Dermatology unit of PGMI, Lady Reading Hospital Peshawar.

STUDY DESIGN: Quasi experimental study.

DURATION: Six months (November 2009 to April 2010).

SAMPLE SIZE: Prevalence of the disease was 10%, margin of errors was 8.5 so as per WHO formula for sample size calculation the total sample size was 60 patients.

SAMPLING TECHNIQUE: Purposive; non-probability sampling.

SAMPLING SELECTION

Inclusion criteria

- Patients of either gender.
- Patients in age range from 18 to 40 years.

- Patients having epidermal melasma.

Exclusion criteria

- Pregnant ladies.
- Lactating ladies.
- Patients taking drugs that cause melasma such as OCPs, anti epileptics.
- Patients with mixed and dermal type of melasma.
- Patients with known sensitivity to salicylic acid.
- Patients showing marked sensitivity during test.
- Patients with known tendency of keloid formation.
- Patients who have taken other treatment for melasma in last two months to give wash out period.

DATA COLLECTION PROCEDURE

Written permission was taken from the hospital ethical committee. Patients with epidermal melasma coming to skin OPD of Lady Reading Hospital, Peshawar meeting the inclusion criteria were selected for the study. After explaining the procedure written informed consent was taken from each patient. Demographic characteristics were noted and relevant history was taken. Patients were treated by a series of six fortnightly hospital based peeling sessions and followed up for a period of one month after completion of treatment period. First three peels were done by 20% salicylic acid. For next 3 peelings concentration was increased to 30%. Test peel was performed with 10% salicylic acid in retro auricular area one day prior to actual peel by doctor to look for any adverse effect as per attached annexure no3. Patients with marked sensitivity during test peel showing excessive and burning were not subjected to further sessions. During peeling face was washed with soap and water. Peeling was done with cotton wool applicator dipped in salicylic acid applied to the affected area. Initial contact time was 5 min, which was increase with 1 min increment on subsequent visits.

Adverse effects were observed as per attached annexure no 3 and dealt accordingly. Patients were prescribed sunscreen creams during daytime and avoidance of soaps and sun exposure for two days after peeling sessions.

Pre peel MASI score was calculated at the time of enrollment. At the end of peel sessions it was calculated again and one month after the final peeling session. Changes in MASI score in comparison with base line were noted as % improvement. All the relevant informations were entered in the proforma.

Data Analysis:

All the data was analyzed in SPSS version 10.0. Mean and standard deviation was computed for quantitative variable i.e. age, duration of melasma, MASI score where as frequency and percentages were calculated for qualitative variables such as gender, marital status, occupation and drug history. Student t test was used to find the co relation between MASI score and $P < 0.05$ considered significant value. The results were presented in the form of table and charts.

RESULTS

In the present study 60 cases of epidermal melasma were enrolled in Dermatology Department of Lady Reading Hospital, Peshawar. Age distribution among 60 patients were analyzed as n=6(10%) patients were found in age group <20 years, n=32(53.33%) patients were found in age group 21-30 years and n=22(36.67%) patients were found in age group 31-40 years. Mean age was calculated as 28 years where as SD ± 3.42 years. (as Shown in Table No.1). Gender distribution was analyzed among 60 patients as n=45(75%) patients were female while n=15(25%) patients were male. Male to female ratio was 3:1. (as Shown in Table No. 2). Duration of melasma among 60 patients was analyzed as n=7(11.67%) patients had melasma ranged < 1 years, n=30(50%) patients had melasma ranged from 2-3 years, n=15(25%) patients had melasma ranged from 3-4 years and n=8(13.3%) patients had melasma ranged from 4-5 years. Mean duration of melasma was calculated as 3 years where as SD ± 1.22. (as Shown in Table No.3)

The type of skin was analyzed as n=40(60%) patients had photo type IV type of skin while n=20(40%) patients had photo type V type of skin. (as Shown in Table No.4).

The main precipitating factor was analyzed as sun light in n=45(75%) cases followed by pregnancy n=27(45%) cases, oral contraceptive pills in n=9(15%) cases. Family history was present in n=28(46%) cases. (as Shown in Table No.5). The clinical pattern of Melasma observed showed the prevalence of malar pattern. Thirty seven (61.6%) cases had malar pattern of melasma followed by centro facial pattern in 23 (38.4%) cases. Mandibular pattern was not observed in any of the patients. (as Shown in Table No.6).

The mean MASI score at base line was 15.68 (range 5.6 to 27.6). It was reduced to 5.78 (range 3.8 to 13. 78) at end of six peeling sessions. It represents 63.13% improvement in base line MASI score. The mean MASI score at end of 1 month follow up period was 4.12 (range 3.12 to 11.90). It represents a 73% improvement in base line mean MASI score (as shown in Table No. 8) the response to chemical peeling was highly significant 7(11.6%) cases had mild response 44(73.3%) had moderate response and 9(15%) showed good response in terms of percentage improvement MASI score.

Among 60 patients 56 patients suffered transient erythema, burning and stinging that settled in half an hour with out any treatment. Six (10%) cases suffered

Table No 1. Age Distribution (N=60)

Age	Frequency	Percentage
< 20 Years	6	10%
21-30 Years	32	53.35%
31-40 Years	22	36.65%
Total	60	100%

Mean age was 28 Years
Standard Deviation was ± 3.42 years

Table No 2. Gender Distribution (N=60)

Gender	Frequency	Percentage
Male	15	25%
Female	45	75%
Total	60	100%

Table No 3. Duration of Melasma (N=60)

Duration of Melasma	Frequency	Percentage
< 1 Years	7	11.7%
2-3 Years	30	50%
3-4 Years	15	25%
4-5 Years	8	13.3%
Total	60	100%

Table No 4. Type of skin (N=60)

Type of skin	Frequency	Percentage
Photo Type (IV)	40	60%
Photo Type (V)	20	40%
Total	60	100%

Table No 5. Precipitating Factor (N=60)

Precipitating Factor	Frequency	Percentage
Sun Light	45	75%
Pregnancy	25	45%
Oral Contra-ceptive Pills	9	15%
Family History	28	46%

Table No 6. Clinical Pattern of Melasma (N=60)

Clinical Pattern of Melasma	Frequency	Percent-age
Prevalence of Malor pattern	37	61.6%
Centro Facial Patterns	23	38.4%
Total	60	100%

Table No 7: MASI score before and after peeling (N=60)

MASI Scores	Mean± SD
MASI score at base line	15.67±1.571
MASI score after peeling session	5.78±0.808
Before – after	9.9
Percent of change	63.13±18.6
MASI score at end of follow up	4.12±1.571
Before – after	11.56
Percent of change	73±18.6

P < 0.001 (Highly significant).

Table 8: Percentage Improvement in Masi Score

IN OUR STUDY GROUP OF
60 PATIENTS
7(11.6%) cases had mild response
44(73.3%) had moderate response
9(15%) had good response

Mild improvement <30%
Moderate improvement 30-60%
Good improvement >60%

Table No 9. Side Effects (N=60)

Age	Frequency	Percent-age
Transient erythema burning and stinging in Half an hour	56	66.6%
Erythema and dryness lasting for 1-2 days	6	10%
Skin peeling	38	63.3%
Development of post inflammatory hypo or hyper pigmentation	0	00%

marked erythema and dryness that persisted for 1 -2 days and was managed with applications of topical steroids and emollients. Thirty eight (63.3%) patients complained of skin peeling that settled in a week time with use of emollients. None of patient's developed post inflammatory hypo or hyperpigmentation, scarring infection or any systemic side effects. None of patients were lost for follow up due to side effects. (as shown in Table No 9).

DISCUSSION

Melasma is a common problem in our population due to intense ultraviolet radiation and predominant fizpatrick skin type IV and V.[2]

Changes in Mean Masi Score

IN OUR STDUY GROUP	IN THE STUDY BARI
Mean MASI score before treatment 15.68	Mean MASI score before treatment 12.57
Mean MASI score after six peeling sessions 5.78	Mean MASI score after six peeling sessions 6.29
Mean MASI score after 1 month follow up period 4.12	Mean MASI score after 1 month follow up period 5.16
Average decrease in Mean MASI score 11.56	Average decrease in Mean MASI score 7.41
P values less than 0.001	P value less than 0.001

Percentage Improvement in Masi Score

IN OUR STUDY GROUP OF	IN THE STDUY BARI
60 PATIENTS	40 PATIENTS
7(11.6%) cases had mild response	2(5%) had mild response
44(73.3%) had moderate response	29(72.5%) had moderate response
9(15%) had good response	9(22.5%) had god response

Facial chemical peeling is being increasingly employed as a therapeutic modality for treatment of melasma.[4] It produces a controlled partial thickness injury to skin. Following this insult, a wound healing process ensues that can regenerate epidermis and replace and reorient the new dermal connective tissue resulting in improved clinical appearance of skin.

Our findings regarding the age incidence of melasma in the present study were in concordance with study of Bari et al carried in MH Hospital Pindi. Pakistan[5]. They showed that 80% patients were in their third and fourth decade and their calculated mean age was 24.70 years. The study of Silonie et al done in Rajindra Hospital, Patiala, Punjab[3] also showed mean age of 27.55 years. Age distribution of melasma was similar in our study group & in referred studies as melasma is very common in reproductive age due to pregnancy and use of OCPs, which either cause or further aggravate melasma

In our patients sample 45 (75%) case were females and male to female ratio of 1:3. This shows female preponderance. In the study of Sarkar *et al* done in Chandigarh Hospital, Chandigarh, India[6] out of 40 melasma patients, 22 were females and 18 males. The study of Bari et al carried at MH Hospital, Pindi, Pakistan[4] showed female to male ratio of 3:1.

In our study gender distribution of melasma shows that's it is more common in females. The above referred Pakistani and Indian studies also show female preponderance. This is because ladies present more frequently and much earlier due to cosmetics effects of melasma. Secondly repeated pregnancies and use of OCPs are other additional factors to which they are exposed

Our finding regarding the age and gender distribution of melasma highlighted the fact the melasma commonly affect woman especially during third and fourth decade of life which are the most reproductive years of life. These findings were consistent with the above mentioned earlier studies.

The duration of melasma in our study varied from 6 months to 5 years with mean duration of 3 ± 1.22years. Thus mean duration of the melasma was lower than the mean duration quated by Dorga et al in their study conducted in Deyanand Hospital, Ludhian, India[4], where mean duration was 5 years. The study of Safora et al carried in Mayo Hospital, Lahore, Pakistan[2] showed the mean duration of disease to be 4.2 years in their patient sample. The comparison of duration of disease in our study patients to these studies implies that our patients presented earlier for expert dermatological consultation.

Regarding the etiology of melasma sun light was main precipitating factor in our patients sample reported by 45 (75%) cases. In our province sun light is very intense and most of people have frequent and unprotected exposure to sun. This fact was confirmed by the studies of Silonie et al Carried at Rajindra Hospital, Patiala Punjab[3] and Taylor et al conducted at university of Toronto, Canada[7]. In their patient sample sun light was the main precipitating factor reported by 56% cases & this shows that melasma is prevalent in those living in areas of intense ultra violet radiation.

In our patient sample pregnancy was the second important precipitating cause observed in 25(45%) cases followed by cosmetics in 15 (25%) cases and oral contraceptive pills in 9 (15%) cases. Dogra et al in their study conducted at Dayanand Hospital, Ludhiana, India[4] also reported the same precipitating factors with pregnancy in 44%, cosmetics is 22% and oral contraceptive pills in 14% of their study patients.

The figures derived from our study as well as the above mentioned study regarding the etiology of melasma are move or less similar. This shows that hormones are the main factors responsible for stimulating melanocytes to cause increase melanin synthesis and producing hyper pigmented patches of melasma during pregnancy. Theses factors are some times compounded by post inflammatory hyperpigmentation produced by injudicious use of various beauty creams and herbal cosmetics.

In the present study genetic predisposition was seen in 28(46%) cases who had given positive family history of melasma. This was in concordance with the observation of Safora *et al* in their study conducted at Mayo Hospital, Lahore Pakistan[2] showing genetic pre-

disposition in 40% of cases. Figures regarding genetic predisposition of melasma were more or less similar in our study patients and referred study showing that in people with positive family history of melasma, exposure to sun light or hormonal changes can readily induce melasma as compared to people without family history of melasma.

In this study 40 (66.6%) cases were having skin photo type IV and 20(33.3%) cases had skin photo type V. This was in concordance with the study of Safora et al at Mayo Hospital, Lahore, Pakistan[2] observed that in their patient sample 50% had skin photype IV and rest of fifty percent had photo type V.

Our figures regarding skin types were in concordance with the study of Safora et al[2]. We observed that skin types among people of Peshawar N.W.F.P were phototype IV &V which are also common skin types among Asians as the refered study population was Pakistani.

Our demographic data demonstrated that predominant clinical pattern of melasma is malar as shown by 37(61.6%) cases followed by centro facial pattern observed in 23(38.3%) cases in skin type IV and V.

The study of Moin et al at department of dermatology, Shahed University, Tehran, Iran[8] showed that malar pattern (65%) predominated over Centro facial (33.8%) pattern. Dorga et al in their study conducted at Dayaanand Hospital, Ludhiana India[4] Showed that malar pattern was present in 96% of their cases followed by Centro facial pattern in 70% cases.

The common skin types in our study population and in the study of Dorga et al[4] were phototype IV and V. The study population of Moin et al[8] consisted of fair skin types but still malar pattern was common among their cases. This shows that irrespective of skin phototype, malar pattern of melasma is the prevalent pattern.

Our finding regarding reduction in mean MASI score are consistent was that of Bari et al in their study at MH Hospital Pindi, Pakistan[9]. Their base line mean MASI score was 12.57 which reduced to 6.29 at end of 6 peeling sessions salicylic acid. There was an improvement of 49% in MASI score. At the end of their 1 month follow up mean MASI score was dropped to 5.16 which shows 58% improvement in MASI score. Their P value was also <0.001.

Our figures regarding decrease in mean MASI score are more or less similar to that of above reffered study because they also included patients only with epidermal melasma which is more responsive to superficial peeling agents as compared to mixed and dermal types.

The response to chemical peeling was highly significant 7(11.6%) cases had mild response, 44(73.3%) had moderate response and 9(15%) showed good response in terms of percentage improvement in MASI score. By mild improvement we mean <30% improvement in MASI score. Moderate means 30 – 60% improvement and good shows more than 60% improvement in MASI score.

These figures are consistent with that of Bari et al[4] who in their study carried at MH Hospital Pindi, Pakistan.[9] showed that 72.5% had moderate and 22.5% had good response with salicylic acid in treatment of melasma.

Our data regarding percentage improvement in MASI score had similarities with that of Bari et al[9] as base line mean MASI score were not very different between the two studies and we used same concentration of salicylic acid during peeling as used in the refered study

Fifty six (93.3%) out of 60 patients suffered transient burning, irritation and stinging just after application of salicylic acid. These sensations lasted for 3 to 4 minutes and then settled in half an hour after washing the face with out any treatment. The tolerance of patient kept on increasing with each peel and above mentioned complaints were reported in decreasing frequency with subsequent peeling sessions.

Six (10%) patients suffered marked erythema and dryness. These complaints persisted for 1 – 2 days after peeling session & were efficiently managed with application of 1% hydrocortisone cream for 3 – 4 days and emollients.

Thirty eight (63.3%) patients complained of skin peeling for 2 to 3 days after chemical peeling. It settled in one week time with the use of emollients and was followed by decrease in intensity of pigmentation in affected patches.

None of the patients complained of post inflammatory hyper pigmentation or hypo pigmentation of the affected or surrounding skin. This was quite encouraging because chemical peeling is considered a risk factor for developing post inflammatory hyper pigmentation especially in dark skinned populations. None of patients developed infection, scarring, allergic sensitization or systemic side effects. None of the patients lost to follow up due to side effects.

Side effects profile observed in our study is in concordance with the study of Bari et al conducted at MH Hospital Pindi, Pakistan[9] on the efficacy of salicylic acid in treatment of melasma.

They observed temporary burning and stinging in almost all of their 40 patients. 4 of their patients suffered marked erythema and dryness which settled in a week time. Two of their patients developed herpes labialis. None of the patients developed post inflammatory hyper pigmentation or systemic side effects.

These figures suggest that side effect and safety profile of salicylic acid as superficial chemical peeling

agent in treatment of melasma are similar to other local[1,9] and international studies[4,10,11,12] as skin proto types were similar and peeling was started with low concentration followed by slight increase in concentration and small increments in time of peeling session. Due to these factors patient's tolerance increased with time and no major side effects observed

CONCLUSION

Superficial chemical peeling with salicylic acid is an effective and safe treatment modality for the treatment of epidermal melasma.

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