

## ORIGINAL ARTICLE

## OUTCOME OF TOPICAL 10% ZINC SULPHATE SOLUTION IN THE TREATMENT OF MELASMA

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**Background:** Melasma is a common, acquired, benign skin disorder, characterized by symmetrical hyperpigmented patches on exposed areas, predominantly the face. This study was designed to assess the efficacy of topical zinc sulphate solution (10%) in the treatment of melasma. The objective of this study was to determine the mean difference in Melasma Area and Severity Index (MASI) after topical 10% zinc sulphate solution in the treatment of melasma. **Methods:** This quasi experimental study was done in the department of dermatology Sir Ganga Ram Hospital/Fatima Jinnah Medical University, Lahore, from November, 2016 to May, 2017. Seventy patients, who had epidermal type of melasma on the face (assessed by woods lamp examination), of any severity and duration, were selected. All patients underwent treatment with 10% topical zinc sulphate solution twice daily for 8 weeks. The patients were advised to use sunscreen during day time. The severity of melasma was assessed by MASI score at baseline and one day after completion of 8 weeks of therapy. The findings were recorded on a predesigned proforma for each patient. MASI score next day after the completion of treatment was subtracted from the baseline MASI score for each patient and then mean difference in MASI score was calculated. **Results:** All 70 patients completed the study. There was 10 (14.3%) were male and 60 (85.7%) were female, with mean age of 33.23±6.75 year. We recorded mean difference in MASI score before and after treatment as 4.76±1.72 (47.36%). **Conclusion:** Study showed that topical 10% zinc sulphate solution is a cheap, safe and effective agent for the treatment of melasma in our population.

**Keywords:** melasma, zinc sulphate, MASI

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### INTRODUCTION

Melasma is a common, acquired, benign skin disorder, characterized by symmetrical hyperpigmented patches on exposed areas, predominantly the face.<sup>1</sup> It is associated with enormous emotional effect due to cosmetic disfigurement of the face.<sup>2</sup> It has a significant impact on the quality of life, especially on wellbeing, social life and recreation of the patient.<sup>3</sup> It has been observed that the injudicious use of various medicated creams for the treatment of melasma, results in many side effects including acne, skin thinning and aggravation of hyperpigmentation.<sup>2,3</sup>

Melasma is a very difficult condition to treat.<sup>4</sup> Bleaching agents, chemical peels, intense pulsed light (IPL) and fractional skin resurfacing have all been used with some success.<sup>5</sup> Despite advances in treatment, the results of these therapies are unsatisfactory and associated with many adverse effects. Hydroquinone is the most commonly prescribed depigmenting agent but there are concerns regarding its side effects.<sup>1,6,7</sup>

Topical zinc is gaining attention of dermatologists due to its beneficial effects on skin as an anti-inflammatory, antioxidant, photo-protective and healing agent.<sup>6,7</sup> It has been used in the treatment of many dermatologic disorders and has been recently used in the treatment of melisma.<sup>8,9</sup> A study done in

Iraq showed 49.78% improvement in MASI score after treatment with 10% zinc sulphate in patients with melisma.<sup>8,10</sup> This study was conducted to find out the efficacy of topical zinc sulphate in the treatment of melasma of our skin type which is Fitzpatrick skin type IV.

### MATERIAL AND METHODS

This was a quasi-experimental study, done in the department of Dermatology, Sir Ganga Ram Hospital/Fatima Jinnah Medical University, Lahore, from November 2016 to May 2017 after approval by Ethical Committee of the University. Seventy patient who had epidermal type of melasma on face (assessed by wood's lamp examination), of any severity and duration, were selected randomly from outpatient Department of Dermatology, Sir Ganga Ram Hospital, Lahore, excluding those patients who had known allergy to zinc. Written informed consent was taken from all patients. MASI score in each patient was calculated as following:

The face was divided in four regions: forehead (F), right malar (MR), left malar (ML) and chin (C), the severity of melasma in each four regions (forehead 30%, right malar 30%, left malar 30% and chin 10%) will be assessed based on three variables: percentage

of total area involved (A), darkness (D) and homogeneity (H) (Table-1, 2, 3).

**Table-1: Numerical value assigned for the corresponding percentage area (A)**

0= No Involvement
1= <10% Involvement
2= 10–29% Involvement
3= 30–49% Involvement
4= 50–69% Involvement
5= 70–89% Involvement
6= 90–100% Involvement

**Table-2: Darkness of melasma (D) compared to the normal skin and graded on scale of 0 to 4**

0= normal skin colour without evidence of hyperpigmentation
1= barely visible hyperpigmentation
2= mild hyperpigmentation
3= moderate hyperpigmentation
4= severe hyperpigmentation

**Table-3: Homogeneity of hyperpigmentation (H) graded on a scale of 0 to 4**

0= normal skin color without evidence of hyperpigmentation
1= specks of involvement
2= small patchy areas of involvement <1.5 Cm diameter
3= patches of involvement >2 Cm diameter
4= uniform skin involvement without any clear areas of skin

MASI Score was calculated by equation:

$$\text{Forehead } 0.3 (D+H) + \text{A+right malar } 0.3 (D+H) + \text{A+left malar } 0.3 (D+H) + \text{A+chin } 0.1 (D+H) + A$$

Baseline MASI score was calculated, photographs were taken before starting therapy and one day after completion of treatment. Frontal, right and left views were photographed of each patient in the same place with fixed illumination and distance, by same photographer. Topical 10% zinc sulphate solution was made by order and at expense of researcher from local pharmacy (by dissolving 10 g of zinc sulphate crystals in 100 ml of distilled water). All patients applied 10% zinc sulphate solution twice a day for 8 weeks. They were instructed to apply a broad spectrum sunscreen with SPF>30 during the day. Patients were monitored for compliance and improvement every fortnightly during treatment of 8 weeks. MASI score was re-calculated next day after the completion of 8 weeks of treatment by same single physician to calculate difference in MASI score according to operational definition. All information was collected on a specially designed proforma. Collected data was analysed on SPSS-21. Mean±SD was calculated for quantitative variables like age. Qualitative variable like gender were presented as frequencies and percentages. MASI score was calculated before treatment and next day after the completion of treatment. MASI score next day after completion of treatment was subtracted from baseline MASI score for each patient, and mean difference in MASI score was calculated.

## RESULTS

Out of the enrolled 70 patients, 10 (14.3%) were male and 60 (85.7%) were female, with mean age of 33.23±6.75 years. Baseline mean MASI score was calculated as 14.81±4.93 and after treatment. It was calculated as 10.05±4.61. Mean decrease in MASI score before and after treatment was 4.76±1.72 (47.36%) (Table-4). No significant side effects were seen in any patient.

**Table-4: Mean MASI score (n=70)**

Baseline	14.81±4.93
One day post-treatment	10.05±4.61
Mean decrease in MASI score	4.76±1.72

## DISCUSSION

Melasma is an acquired increased pigmentation of the skin and is a common presentation in clinical practice. It has a high prevalence in Asian and Hispanics.<sup>11</sup> According to a study conducted in Pakistan, melasma has a huge impact on patient’s quality of life, impairment being greater in females and in patients with severe disease.<sup>12</sup>

Women are predominantly affected but men are not excluded from melasma, representing approximately 10% of the cases, and it is rarely reported before puberty.<sup>11</sup> Our study shows a similar gender distribution, with majority of cases being females. Out of total 70 patients, 14.3% (n=10) were male and 85.7% (n=60) were female.

In a study by Sharquie *et al*<sup>10</sup> the efficacy of 10% zinc sulphate solution was evaluated in 14 patients. MASI score grading system was used to assess the degree of improvement. Before treatment the MASI score was 9.45, which changed to 4.70 post-treatment. This corresponded to a percentage improvement of 49.78% and was statistically significant ( $p<0005$ ). Out of those 14 patients, 11 patients maintained an improvement without any obvious relapse in 3 months follow-up after cessation of therapy.<sup>10</sup> Our study showed similar improvement in MASI score 4.76±1.72 (47.36%) further supporting use of this modality. In a study conducted by Yousefi *et al*<sup>13</sup> in Iran, 82 patients were randomized to receive zinc sulphate 10% or hydroquinone 4% solution once daily for 2 months. They were followed for an additional 3 months while using sunscreen. The MASI score was significantly reduced in both groups but a greater fall in MASI score was seen in those patients who received hydroquinone (43.5±15.5% vs 18.6±20, 8%,  $p<0.001$ ). Our study showed better results with zinc sulphate compared to this study (47.36% improvement). This could be due to twice daily application of zinc and also could be due to variation in response in our population.

Yenny and Lestari<sup>14</sup>, conducted an observational study with cross-sectional design and single-blind, comparing the left and right side of the faces with 10% L Ascorbic acid and 10% zinc sulphate. After 2 months of treatment, there was significant improvement of melasma treated with 10% zinc sulphate with lesser side effects as compared to L Ascorbic acid. Our study showed lesser reduction in MASI score (4.76 vs 6.29) than the above study, this could be due to different genetic makeup and response of treatment between Indonesians and Pakistanis, or because patients having all forms of melasma were included in the above study.

So far, a very few studies highlight the efficacy of topical zinc sulphate in the treatment of melasma. However, in Pakistan, no concrete data was available in this regard. The results of our study have shown that topical zinc sulphate may be used in our population as a treatment modality for melasma. Since melasma is a prevalent and distressing pigmentary disorder, the interest and efforts to find new treatment modalities, which are safe, cheap and readily-available, are constant and non-stopping.

## CONCLUSION

The 10% topical zinc sulphate solution is effective and safe agent for treatment of melasma, is cheap, and convenient to use. Its use has additional benefit of reduced hospital visits unlike peeling and laser which cause inconvenience to the patients.

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