

Effectiveness of 3% arbutin cream in the treatment of epidermal melasma

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ABSTRACT

Background: Melasma is a common acquired, circumscribed hypermelanosis of sun-exposed areas. Multiple treatment options are available for melasma but they require a long time to yield effective results. Arbutin has shown promising results in the treatment of melasma. The objective of this study was to determine the effectiveness of 3% arbutin cream in the treatment of epidermal melasma.

Patients and Methods: It was an interventional study conducted at the Department of Dermatology, Sir Ganga Ram Hospital, Lahore from 1st September, 2011 to 29th February, 2012. After approval from the Hospital Ethical Committee a total of 120 patients with epidermal melasma (diagnosed on Wood's Lamp Examination), were enrolled in the study. All the patients were advised to apply 3% arbutin cream twice daily for 12 weeks. They were advised to do follow up visits every 2 weeks with a final visit 2 week after completion of treatment. Melasma Area Severity Index (MASI)¹ score was calculated at the baseline and 2 weeks after completion of treatment period. Efficacy was measured by the decrease in MASI score ($\geq 50\%$). All the information was collected on a specially designed proforma. Photographs were taken at the start and end of study period.

Results: There were 7 (5.8%) male patients and 113 (94.2%) female patients in the study. The male to female ratio was 1:16.4. The mean age of patients was 33.93 ± 6.1 . In this study, 65 patients (54.16%) showed improvement in terms of $\geq 50\%$ reduction in MASI score at 2 weeks follow up visit after the completion of treatment.

Conclusion: Use of arbutin 3% cream is an effective treatment modality in patients of epidermal melasma.

Keywords:

Efficacy; melasma; arbutin.

INTRODUCTION

Skin color is considered a universal sign of beauty. Pigmentary abnormalities can affect individuals in several forms e.g. freckles, lentiginos and melasma, depending on the skin type. Melasma is a common acquired, circumscribed hypermelanosis of sun-exposed areas.² Clinically, it presents as symmetrical, hyperpigmented macules & patches, having irregular, serrated and geographic borders which are commonly located on the cheeks, upper lips, chin and the forehead, but other sun-exposed areas may also occasionally be involved.³ Three clinical patterns of distribution of pigmentation may be recognized: Centrofacial, malar and mandibular.⁴ Women are affected most of the times (approximately 90% cases) but this is also seen in men.⁵ Among pregnant ladies, the incidence of melasma

is 50%.⁶ Multiple treatment options are available for melasma, but they require a long time to yield effective results. Despite advances in dermatological therapies, no concrete data is available in Pakistan regarding the use of arbutin, therefore, this study was planned to find out results are unsatisfactory. Arbutin, the β -D-glucopyranoside derivative of hydroquinone, has shown promising outcome in the treatment of melasma.⁷⁻¹² Since, the effectiveness of 3% arbutin as a sole agent in cream formulation. The results would support use of arbutin as better option in the treatment of patients suffering from melasma.

PATIENTS AND METHODS

It was an interventional study conducted at the Department of Dermatology, Sir Gang Ram Hospital, Lahore from 1st September 2011 till 29th February 2012. A total of 120 patients with epidermal melasma (diagnosed on Wood's Lamp Examination), were enrolled in the study. Demographic data was recorded.

Competing interest: The authors have declared no competing interests exist.

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Pregnant and lactating females and those with history of any drug allergies were excluded. All the patients with low hemoglobin, liver disease and those on oral contraceptive pills were also excluded from the study. All the patients were advised to apply 3% arbutin cream twice daily for 12 weeks. The cream was dispensed to the patients from a local pharmacy containing 3% arbutin and 97% aqueous cream base. The patients were instructed to use a sunscreen (SPF 30) after applying the arbutin cream in the morning. They were advised to do follow up visits every 2 weeks with a final visit 2 weeks after completion of treatment. MASI score was calculated before the commencement of treatment and 2 weeks after completion of treatment. All the information was collected on a specially designed proforma. Effectiveness was evaluated by a decrease in MASI score ($\geq 50\%$) as measured by medical imaging software. Patients were monitored for compliance and improvement every 2 weeks. All the collected data was entered on SPSS version 20 and analyzed. The qualitative data like demographics and outcome parameters (effectiveness - yes/no) were presented as frequency and percentage. Quantitative data like age and MASI score were presented as mean and standard deviation.

RESULTS

In this study, total number of patients enrolled (N) were 120. There were 7 (5.8%) male patients and 113 (94.2%) female patients. The male to female ratio was 1:16.4. The mean age of patients was 33.9 ± 6.1 (range 20–50 years). The percentage decrease ($\geq 50\%$) in MASI score was observed in 65 (54.16%) patients while it was not observed in 55 (45.83%) patients (Figure 1). The mean MASI score before treatment was 14.5 ± 5.1 while after treatment it was 7.35 ± 2.46 (Table 1). The effectiveness is evident in Figures 2, comparing the pre- and post-treatment results in different patients.

DISCUSSION

Melasma is a refractory and recurrent condition, so it is difficult to treat. Various treatment options are used to different plants, including bearberry (*Arctostaphylos uva-ursi*), blueberry, cranberry, and pear trees. Arbutin decreases tyrosinase activity and inhibits melanosome maturation.^{9,14} No local study is available to assess the effectiveness of topical arbutin in melasma; however, few international studies are available in this regard but even these have not assessed its efficacy as a single agent.⁷⁻¹³

Table 1. Mean of MASI score before and after treatment (N= 120).

MASI Score	Mean \pm SD
Before treatment	14.5 \pm 5.1
After treatment	7.6 \pm 2.4

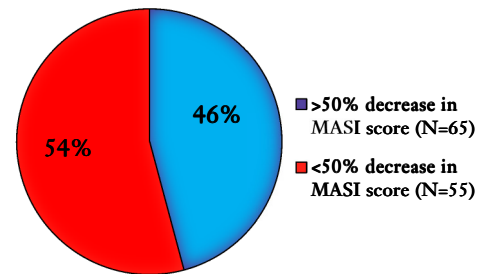


Figure 1. Showing efficacy ($\geq 50\%$ decrease in MASI score).

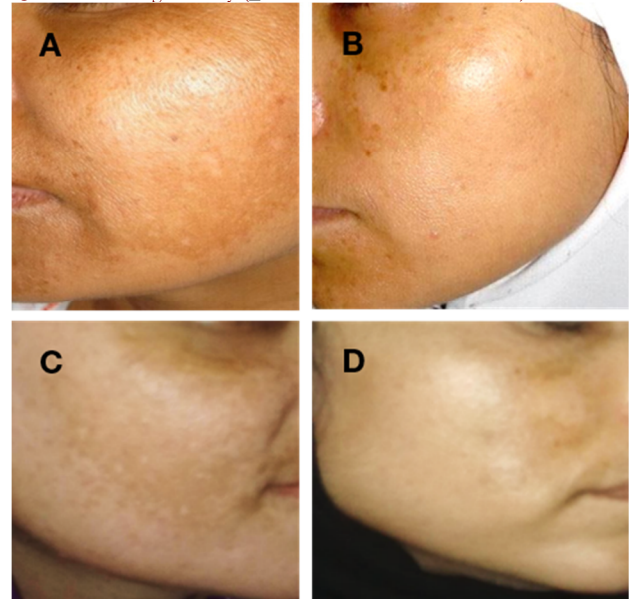


Figure 2. Photographs showing effectiveness of 3% arbutin cream for 12 weeks for the treatment of melasma. A & C) Before treatment. B & D) After treatment.

Rigopoulos and group conducted a study in the Clinic of Skin and Sexual Transmitted Diseases of University Hospital of Athens.⁷ Twenty female patients with epidermal melasma were treated with a combination of 3% Arbutin, 2% Kojic acid and 4% Vitamin C cream applied twice daily along with the use of sunscreen, for a treat melasma with different success rate depending on which drugs are used.²⁻¹⁴ Arbutin is a β -D- glucopyranoside derivative of hydroquinone, naturally occurring compound derived from the dried leaves of period of 12 weeks. They found significant improvement in 55% (decrease in MASI score $\geq 50\%$), medium improvement in 35% (decrease in MASI score (50–20%)) and slight improvement in 10% patients (decrease in MASI score $< 20\%$). In present study,

54.2% of the patients manifested $\geq 50\%$ decrease in MASI score which is comparable with the results of above mentioned study. Sugai conducted a study to evaluate the efficacy of 3% arbutin containing products for the treatment of chloasma.¹⁰ These combination compounds were used in 33 female patients with chloasma for 12 weeks. Moderate improvement was reported in 35.7% and slight improvement in 71.4% patients. Han and colleagues conducted a study using hydrogel mask that contained 2% arbutin for the treatment of melasma.¹¹ Fifty four female patients with melasma were enrolled in this study and duration of study was 8 weeks. The patients were instructed to apply an arbutin-containing mask or an arbutin-free mask once a day for 8 weeks. MASI score decreased more in the arbutin mask group (p-value > 0.05). Ertum and associates conducted a comparative trial of ellagic acid and arbutin.¹² A total of 10 female patients were treated with 1% arbutin cream and significant response (p-value < 0.05) was obtained in all 10 patients. Compared to the above-mentioned studies, where number of patients had been less, study population in the present study is large (N=120), hence the results of this study may be deemed more dependable. Furthermore, in all above mentioned studies, arbutin was used in combination with other bleaching agents so it was difficult to comment on its efficacy alone in the treatment of melasma. However, in this study, arbutin has been used as monotherapy, so the improvement observed may more reliably be attributed to arbutin.

CONCLUSION

It is concluded from this study that 3% arbutin is an effective treatment modality in the treatment of epidermal melasma.

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