Evaluate the efficacy of intradermal tranexamic acid in melasma.

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ABSTRACT… Objective: To evaluate the efficacy of intradermal tranexamic acid in melasma. Study Design: Cross-Sectional study. Setting: Out-patient Department of Dermatology at Dow University of Health Sciences. Period: January 2018 to June 2018. Material & Methods: Enrolling 73 patients the research was done on patients with resistant melasma. For this 0.2 ml tranexamic acid diluted in 0.8 ml normal saline was injected intradermally into the melasma lesion at 1 cm distance at every 2 weeks for 4 months and results were analysed by using the modified Melasma Area and Severity Index (MASI) at their first visit and then monthly with strict sun protection. A total of 73 patients were included in this study with age ranging from 22 years to 47 years. All of them had resistant melasma and had not taken any treatment for the last six months. Results: Out of 73 patient 10 (13.7%) patients had poor response, 48 (65.8%) patients had fair response, 14 (19.1%) patients had good responses and only 1 (1.4%) had excellent response. No significant side effects were observed. Out of 73 patients, 63 patients were satisfied with the treatment. Only 2 patients complained of redness over the affected area which subsided within a week without any intervention, no other side effects were noted. Conclusion: Intralesional tranexamic acid is safe, effective and an affordable option in resistant melasma.

Key words: Melasma, MASI, Tranexamic Acid.

INTRODUCTION

Melasma is the most prevalent and distressing pigmented disorder among Asians women mainly in their reproductive years, but 10% involvement is also observed in men.1 It is a most frequent acquired hypermelanosis, which affects sun-exposed areas of the skin. Sun exposure, pregnancy, hormonal treatment and endocrinological disorders are the most common aggravating and precipitating factors.2 Melasma frequently causes a considerable psychological influence with a negative effect on quality of life and emotional well-being.3

The most common age of melasma in adults women is between 30 years to 40 years, but it can start earlier before 30 years or after 40 years, or even seen in post-menopausal women. In fairer skin, it usually manifest earlier, whereas in darker skin, it manifest late. Usually women observed this type of pigmentation in pregnancy or after the pregnancy, while only 20% of melasma occurred before the pregnancy. The main risk of onset during pregnancy was the hormonal cause and associated with increased sun exposure.4,5

There are three clinical patterns of melasma according to their localization: a centrofacial pattern, a malar pattern, and a mandibular pattern. Melasma can also be classified on the basis of localization of melanosomes either in the epidermis or dermis which can be assess by examination of patients with Wood’s light (365 nm). There are four types of melasma which are described on the basis of Wood’s light examination: an epidermal type, a dermal type, a mixed type, and a fourth type, described in patients of dark complexion, in which the lesions are not distinct on Wood’s light examination, due to the increased number of melanosomes in the dark skin individuals.6
Different topical agents which affects on pigmentation are hydroquinone, retinoic acid, kojic acid, azelaic acid, and chemical peels including glycolic, trichloroacetic acid, salicylic and lactic acid are in use for treating melasma. All of these have variable result and require long term applications. Physical modalities like lasers and dermabrasion have also been used with limited success. Side effects are observed with these treatment options, especially on prolonged usage which have limited efficacy and more often the condition relapses on discontinuation of therapy. As there is no satisfactory agents for melasma, research is ongoing to develop newer, safer and advanced treatment for treating this psychosocial disorder which causes significant cosmetic disfigurement, and distress to the patient.7

Conventionally Tranexamic acid is a hemostatic drug. It is temperature-stable and does not get easily oxidized.8 It is a lysine analogue with antiplasmin activity and interferes with the structure of plasminogen and preventing the binding of plasminogen to the lysine-binding sites of keratinocytes.9,10 Due to low level of Arachidonic acid there is decrease production of prostaglandin which reduces melanocyte tyrosinase activity and melanogenesis11,12,13 and thus improves melasma.14,15

Acquired defective color vision, an active intravascular clotting disorders, and hypersensitivity to Tranexamic acid are the contraindication of Tranxemamic acid. Furthermore, it should be cautiously prescribed for people with cardiovascular disease, cerebrovascular disease, and those using anti-platelets and anti-fibrinolytic agents. The commonly reported side effects of systemic Tranexamic acid are GI complaints (nausea, diarrhea, and abdominal pain).16

**MATERIAL & METHODS**

The research is Cross-sectional analytic study, conducted in the out-patient department of dermatology; Dow University of Health Sciences, Karachi, in out-patient department, enrolling 73 patients. The research was done in six months duration. Patient with resistant melasma who were meeting the inclusion criteria were included after taking an informed consent in the study. Patient who were pregnant and lactating women, patients with chronic liver, kidney, heart disease, connective tissue disease, blood dyscrasia, photodermatosis or hormonal diseases, patients on hormonal treatment, facial dermatitis and those who had been treated for the melasma within 4 weeks prior to study were excluded from the study. A complete history was taken regarding the duration of pigmentation and the treatment taken for the pigmentaion and entered into the Performa. Modified MASI score were calculated on the first visit and after every 2 weeks. Photograph of the face were taken after the consent at every visit from the same camera at fix distance with natural light source.

After aseptic measure, topical anesthesia cream was applied, 0.2 ml tranexamic acid diluted in 0.8 ml normal saline was injected intradermally into the melasma lesion at 1 cm distance by using an insulin syringe with a 30-gauge needle. After the procedure patients were strickly advised to avoid sun and heat exposure for 6 to 8 hours. The procedure was repeated after 2 weeks for 4 months. The results were evaluated by using the modified Melasma Area and Severity Index (MASI) at baseline and then monthly. Only sun protection was advised to the patients.

**RESULTS**

The results indicated that out of 73 patients 8 were male while 65 were female (Table-I, Figure-1). Out of 73 patients 10 (13.7%) patients had poor response, 48 (65.8%) patients had fair response, 14 (19.1%) patients had good response and only 1 (1.4%) had excellent response (Table-II, Figure-2). Only 2 patients complaining of redness over the affected area which subsided within a week, with no other side effect noted, like infection, swelling and local pain.
DISCUSSION

Melasma is one of the most common, aquired and persistent hyperpigmentary disorders found mainly in Asian women and dark-skinned patients. There is no exact causative agents or factors for melasma but it is precipitated or aggravated by certain factors like sunlight, hormones and pregnancy. It is very resistant to treatment and the main options are hydroquinone, azelaic acid, kojic acid, Vitamin C and sun protection.

Tranexamic acid is the newer addition in melasma. It can be used orally, topically and intralesionally. It is much safer, convenient and cheaper modality and show benefit in those patients who cannot apply topical agents frequently or develop irritation or acne with the topical agents.

Tranexamic acid is a medication used to treat or prevent excessive blood loss from major trauma, postpartum bleeding, surgery, tooth removal, nosebleeds, and heavy menstruation. It is a synthetic lysine analog, which have an antifibrinolytic activity by reversibly binding four to five lysine receptor sites on plasminogen. It prevents pigmentation caused by ultraviolet light
by interfering with the structure of plasminogen and preventing the binding of plasminogen to the lysine-binding sites of keratinocytes, and it also act on angiogenesis.

In this research study we enrolled 73 patients who had taken conventional treatment with no or partial response, majority had melasma for more than 5 years. Out of 73 patient 63 patients improved while 10 patients did not show any improvement. Similar study conducted in Korea on 100 women by Lee et al in 2006, also showed significant improvement of melasma. Another study conducted in India also showed that tranexamic acid appear to be promising therapeutic option for melasma.

Tranexamic acid is an economical option, appear promising and used as an adjuvant with other therapy. Further studies are however needed with increase concentration of tranexamic acid and with combination therapy. The limitation of the research study is that the size of the sample size can be larger for longer duration treatment.

CONCLUSION
Intradermal tranexamic acid is safe and effective treatment in melasma, side effects which may be observed by taking systemic tranexamic acid can be avoided by intradermal injections. It inhibits melanocyte activation and melanocyte proliferation which is due to ultraviolet light and under the influence of hormones. It also inhibited neovascularization by inhibiting VEGF, and mast cell-induced basement membrane damage. Thus improved pigmentation and erythema. It can be used alone or as adjuvant therapy in resistant melasma.

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REFERENCES


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AUTHORSHIP AND CONTRIBUTION DECLARATION

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