Intralesional Tranexamic Acid: Safe and Effective Way of Treatment for Melasma

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Abstract

Many studies suggested the use of tranexamic acid (TA) as a treatment modality for melasma, however, there are many limitations in the use of oral and intravenous dosage forms of TA because of adverse effects and contraindications resulted by its thrombolytic property. Topical application of TA is not effective because of its poor penetration through epidermis. Intradermal injections into the localized lesions of melasma regions or intralesional administration of TA were reported to be effective way of treatment for melasma with minimum risk of adverse effects. We report a case of a 40-year-old woman, who was treated with a minimum effective dilution of intradermal TA at localized hyperpigmented regions. The results were noted and analyzed with photographs taken during the treatment and by considering the patient satisfaction scores. The patient showed good improvement at the end of 4 weeks.

Keywords: Intralesional, melasma, tranexamic acid

Introduction

Melasma is a common dermatitis characterized with brown colored hyperpigmented areas of skin, usually appearing on sun exposed areas of the face and around the neck. Pathology of melasma is still unclear, however, the causes are likely UV exposure, hormonal imbalance, thyroid disease, contraceptive pills, irrational use of cosmetics, and phototoxic drugs.[1] The usual treatment modalities include measures to nullify the effect of above causes and the use of sunscreens, depigmentation agents along with a combination of laser treatments. The recent developments in tranexamic acid (TA) as a treatment option for melasma, suggest promising results in ultraviolet (UV)-induced melasma.[1] Earlier studies were carried on oral, topical, and intravenous (IV) doses of TA and analyzed the efficacy of TA in various routes of administration with different dosages. [1-3] Based on a recent study on intradermal administration of TA, we report a case of melasma who was treated with localized injections of TA and the results are discussed below.

Oral dosage of 1.5 g of daily TA along with supplements of Vitamin B, C, and E for 5 months showed improvement in 11 out of 12 female patients of age 30–69 years.[3] Since then, oral and topical forms of TA have been used.[4-7]

Case Report

A 40-year-old female patient came with persistent melasma since childhood. They appeared like brown colored hyperpigmented skin lesions and were localized to the cheeks. There was no family history or long-term use of cosmetics. She did not receive treatment for melasma in the past except for sunscreens. The pigmented areas of the face were cleaned properly and then TA dilution of 0.40 ml was administered intradermally into the lesions of melasma. A TA dilution of 0.5625 mg/ml was prepared using insulin syringe with 3 units of tranexamic (TA 100 mg/ml) and 37 units of sterile water. One ml of 0.5625 mg/ml TA was given into the hyperpigmented cheeks regions of melasma patient with an interval of 1 cm, weekly for 4 weeks. The treatment was repeated once per
week for 4 weeks. During the treatment, the patient was given sunscreen alone.

The results were visible after second week, with a significant lightening of the hyperpigmented regions as shown in Figure 1. The brown color patches on the cheeks started diminishing from second week, and there was an improvement in the overall disease, also evident with the photographs and patient satisfaction. The patient was given a total of 4 sessions of intradermal TA and results were significant showing 50% of improvement along with overall whitening of skin. The patient was followed up for one and half month with no return of pigmentation.

**DISCUSSION**

Lee et al., in 2006, injected 0.05 ml of 4 mg/ml TA intradermally into melasma lesions, 1 cm apart for 12 weeks with an interval of one week, with positive results in a group of 100 Korean women.[2] Xu et al. in 2017, suggested significant improvement of melasma on infiltrating the epidermal barrier with microneedles with TA solution.[9]

The study by Xu et al. in 2017 was in accord with the Lee et al., although the results were achieved with microneedling (MN) followed by application of TA solution on diseased areas to facilitate epidermal absorption. This group studied a randomized, self-controlled split face study on 28 women, performed weekly for 12 weeks. The study suggested that more than 25% of improvement was observed in 25 patients who treated with MN plus TA and only 10% was found on the control side of the face which was treated with only 0.5% topical TA.[8]

By considering the above studies, to determine the efficacy of intradermal administration of TA, we decided to treat melasma with TA in a 40-year-old woman with hyperpigmented regions on the face. Since its accidental discovery as a therapeutic option for melasma, many studies suggested the effectiveness of TA in different dosage forms and various routes of administrations. TA is a lysine analog with antifibrinolytic activity works through the inhibition of UV induced melanin synthesis.[1] The use of oral TA in the treatment of melanosomes was first accidentally reported by Sadako in 1979 while treating urticaria in middle-aged women.[3] Although much work was documented on oral, topical, and IV dosage forms of TA, which were showed as significantly effective therapeutic options, there was little work done on intradermal administration of TA onto localized lesions of melasma. The intradermal TA is tends to be an effective and safer route of administration since the others post either ineffective or potential risk of cardiac issues. Poor epidermal infiltration of topical TA would be the major obstacle for its efficacy and higher doses of IV TA could yield adverse reactions since TA is a potential thrombolytic agent. In such cases, localized intradermal administration of TA would be a better choice of therapeutic option for the treatment of melasma. Apart from this, TA also serves as a cost-effective treatment as it costs less when compared to other treatments.

Long-term oral administration of TA may be associated with gastrointestinal adverse effects and an increased risk of thrombosis.[9] The efficacy of the topical TA treatment is limited by the transepidermal absorption.[10] Inefficacy of topical applications of TA and the possible adverse effects with antifibrinolytic activity of TA, oral, and IV administrations have their own limitations. In our study, an attempt was made to treat melasma with a minimum effective dose of TA through intradermal administration.

One of the limitations of the study was shorter follow-up 4 weeks. More randomized controlled or split face studies of longer duration are required to establish safety and efficacy of intradermal tranexamic acid in the treatment of melasma.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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