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Original Article

Effectiveness of topical 2% tranexamic acid in the management of melasma

Zaheer Saleem, Atif Shehzad*, Abeer Shaikh, Kehkshan Tahir, Saadiya Siddiqui†, Uzma Amin**

Department of Dermatology AMC/ PGMI/ Lahore General Hospital, Lahore.
* Department of Dermatology, Unit II, Mayo Hospital, Lahore.
** Department of Histopathology, Rahbar Medical and Dental College, Lahore.
† Department of Dermatology, SIMS, Lahore.

Abstract

Background Melasma is an important issue among the society that severely affects the skin. Hence, there is effort on regular basis from health care provider to find the best remedy for this disease.

Methods This is an experimental study done in the Dermatology department, Lahore general hospital (LGH), Lahore. After taking ethical approval letter from hospital ethical committee, consent was taken from all enrolled melasma patients. Both gender and age between 19 to 45years were selected. All the patients were assessed for baseline MASI score using the MASI questionnaire. Topical 2% tranexamic acid was given to the patients and they were told to keep away from sun light and apply sunblock cream SPF60. Clinical examination, photographs of affected area (Hiding the patient's identity) and MASI scoring was carried out after 12 weeks of treatment to determine the efficacy as per operational definition. The clinical outcome was recorded on proforma. Data was analyzed using SPSS 20.

Results There were total 120 cases of mean age 30.01±6.26 years. 64 (53.33%) were male cases and 56 (46.66%) were female cases. Baseline MASI score was 24.50±4.14, and after 2% tranexamic acid was 23.85±3.90. With respect to efficacy, it was noted that 86 (71.66%) attained positive response from 2% tranexamic acid with significant improvement in males.

Conclusion Topical 2% tranexamic acid is the effective treatment in the management of melasma.

Key words
Tranexamic acid (TXA), melasma area and severity index (MASI) score, melasma.

Introduction

Melasma is an acquired condition of hyper melanosis characterized by hyperpigmentation in the form of macules and patches of irregular shape that commonly effect sun exposed skin area especially face (cheeks, nose, forehead, upper lip, chin) and rarely forearm.

Address for correspondence
Dr. Uzma Amin
Assistant Professor,
Department of Dermatology,
AMC/ PGMI/ Lahore General Hospital, Lahore.
Email: uzmaamindermatologist@gmail.com

Types of melasma include, epidermal type with well-defined borders having dark brown color and clearly seen under wood's light. Dermal type with indistinct border, color lighter than epidermal type, not changed under wood's light and respond less to treatment and the most common mixed type, having bluish to brown color showing mixed appearance under wood's light.[1]

Worldwide, the frequency of melasma lies between 1.5% and 33.3% and in Pakistan is about 15 to 46% including all age groups and

both genders.[2,3] Its incidence in pregnancy is very high i.e. 50-70%.[4] Men also develop melasma especially in central part of face and in mandibular region but still occurrence is less than women.[5] In India prevalence of melasma in men is 20.5-25.83%.[6] About 80 % of melasma occurs in Fitzpatrick's skin type III and IV.[7] Although exact etiology is to be determined, but numerous reasons have been associated in the pathogenesis of the melasma, like ultraviolet (UV) radiation, hormonal factors (pregnancy, hormone replacement therapy, Ovarian disorder, thyroid dysfunction), cosmetics, and drugs e.g. anti-seizure medications.[8] Whatever the etiology lies behind melasma but histologically the feature remained same that include increase pigment and pigment producing cells with in the skin. Genetic predilection is the main triggering factor related to above mentioned reasons for developing melasma.[9] The knowledge of these issues will help dermatologist to treat melasma patients individually, to expand advancement in its prevention and even antedate treatment outcomes and relapse.

Many studies proved that the incidence of melasma reduce significantly after 50 years might be due decrease number of melanocytes and its action.[10] Melasma patients tend to develop psychological and emotional disturbance because it predominantly affects face making it a social stigma thus affecting the life quality. Melasma patients usually feel shame to go out and sometimes develop suicidal ideas, this is what to make them seek a dermatologist consultation. Although melasma is usually diagnosed on clinical and wood's lamp examination but for confirmation and to know its depth biopsy can be done. The MASI INDEX scoring system is used to assess the severity of melasma.[11] Although many treatment options individually or in different combinations have been tried but their efficacy and safety is still questionable.[12]

Tranexamic acid (TXA) inhibits plasminogen keratinocyte interaction and decreases the melanocyte tyrosinase activity leading to decrease melanin synthesis.

Due to high frequency of melasma in both genders especially women, it is need of time to develop and discover actual effective treatment. So it is the basic right of every human to look healthy, beautiful and not to become social stigma among society. The patients of melasma will get benefit from the better treatment option permanently at lowest cost.

Methods

This study was carried out in dermatology department LGH, Lahore over a period of 6 months from March 2020 to August 2020. The present study includes all patients diagnosed with melasma including both male and female of 19 to 45 years age. Base line MASI score of these patients was 6.5 to 32 with skin type III, IV and V according to Fitzpatrick.

The cases with other dermatological disorders like systemic lupus erythematosus, discoid lupus erythematosus assessed on history and clinical examination, pregnant and lactating patients, patients taking oral contraceptive pills, antiseizure medication or concurrent therapy of melasma for past two months, and patients with bleeding and clotting disorders were excluded from the study.

After taking ethical approval from hospital ethical committee, melasma patients were selected after informed consent. Their demographic features i.e. age, gender, address and phone numbers were recorded.

Later patients were given topical 2% tranexamic acid (TXA) and instructed to avoid sun exposure and to use sun block cream SPF 60. Clinical

examination, photographs of affected area (Hiding the patient's identity) and MASI scoring was carried out after 12 weeks of treatment to determine the efficacy as per operational definition. The clinical outcome was recorded on proforma.

All the data was analyzed using the software SPSS 20. Quantitative data like age and effectiveness of TXA and gender distribution under qualitative data was shown by number and fractions.

Results

There were total 120 cases of mean age 30.01±6.26 years. Males were 64(53.33%) and 56(46.66%) were female. Baseline MASI score was 23.85±3.90. On stratification, it was noted that age has significant effect on the efficacy of the treatment as in age group of 19-30 years (66.66%) and (77.8%) in age group of greater than 31 years **(Table 1)**.

Table 1 Stratification of the age for the efficacy in the study population (n=120).

Age	Efficacy of the tranexamic acid	
	Yes (%)	No (%)
19-30 years	66.66)	22 (33.33)
>30 years	42 (77.77)	12 (22.22)
Total	86 (71.66)	34 (28.33)

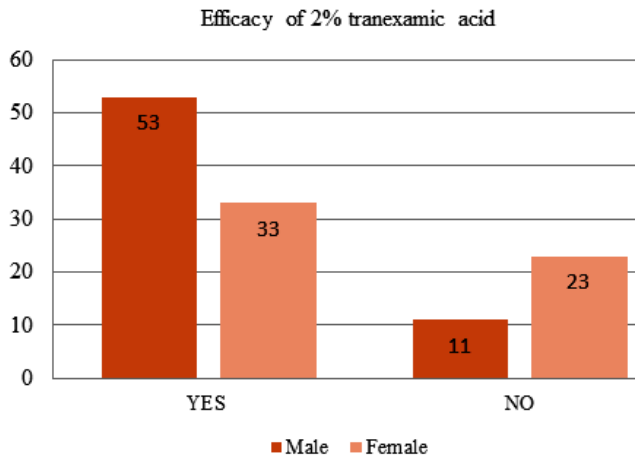

Figure 1 Stratification of the gender for the efficacy in the study population (n=120).

Similarly, there was significant difference noted with respect to efficacy in both gender **(Figure 1)**.

Discussion

The use of tranexamic acid in the management of melasma was initially stated by Nijo in 1979 in Japan. In melasma it has also been used topically and intradermally.[13] Comparable to study done by Saleh *et al*. exploring the effects of a topical TXA emulsion applied to melasma patients. They showed that the 3% TXA emulsion improved (>50% reduction in MASI score from baseline) the pigmentation in majority of patients and also showed the addictive effect of TXA with minimal invasive procedure.[14] Another study done by Atefi *et al.* showed outstanding and safe results of topical TXA in most of the melasma patients.[15] In contrast to a study done by Sahu *et al.*, TXA was efficacious in only 5% of patients, while in our study 71.66 % patients has shown good response to TXA.[16]

Similar to the study in 2016 the effectiveness of 5% topical TXA in the management of melasma was evaluated in a sample of 23 patients. After twice daily application of TXA for 3 months, MASI score was significantly reduced but side effect of erythema and pigmentation were measured objectively. So, in our study 2% TXA used causing no side effect versus 5% TXA used in this study.[17] Although melasma is more common in females due to genetic and hormonal factors and due to testosterone, its less common in males. Similar to study done by Sarkar *et al.* men shows more positive response to treatment than women, reasons are likely genetic, hormonal and some need to be discussed.[18]

Hence, the mission of dermatologist for the use of latest and harmless pigment reducing medicines remains with tranexamic acid in the

management of melasma.

But there is need to conduct this study on a larger number of patients selected from various centers to generate more general results. This will further strengthen the opinion of the dermatologist to select the topical tranexamic acid therapy as an early choice for cases of melasma.

Conclusion

Finally, it was established that topical application of 2% tranexamic acid seems to be a modern medicine which is associated with speedy positive outcome with minimum side effects. Epidermal type of melasma showed significant response as compared to other types. More studies need to know the use of exact percentage of TXA with its long term profits and in combination therapies to establish its additive response.

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