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TOPICAL TRANEXAMIC ACID VERSUS HYDROQUINONE FOR PATIENTS PRESENTING WITH MELISMA

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Abstract:

Introduction: *Epidemiologically, this condition is observed in all geographical and ethnical subgroups, but it occurs with a higher tendency in more pigmented phenotypes, such as East Asians, Middle Easterners, and Mediterranean Africans.* ***Objectives of the study:*** *The main objective of the study is to find the topical tranexamic acid versus hydroquinone for patients presenting with melisma.* ***Material and methods:*** *This descriptive study was conducted in Lahore General Hospital during June 2019 to January 2020. The data was collected from 100 patients who visited the OPD of the hospital regularly. The patients were interviewed to collect demographic and clinical data. The women were also completely examined to assess evidence of skin and physical disorders.* ***Results:*** *The data was collected from 100 patients. The two groups were matched for mean age (38.10 ± 6.27 vs. 39.97 ± 7.86 years,* p *= 0.314), history of receiving systemic drugs (especially thyroid drugs) (30.0% vs. 13.3%,* p *= 0.117), history of systemic disorders (13.3% vs. 6.7%,* p *= 0.671), and family history of melasma (50.0% vs. 46.7%,* p *= 0.796). With respect to the intensity and extension of disease in the two groups, the mean percentage of forehead involvement at baseline was higher in group A than in group B.* ***Conclusion:*** *It is concluded that topical use of TXA can significantly reduce both melanin level and MASI score. This regimen results in high patient satisfaction because of its high efficiency and low drug side effects.*

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INTRODUCTION:

Melasma is a global melanogenesis dysfunction derived from hyper melanosis of the skin due to various underlying risk factors, including sun exposure, hormonal changes, pregnancy, genetic predisposition, combined oral contraceptives, use of cosmetics and photosensitizing drugs, hepatic disorders, and inflammatory processes. Epidemiologically, this condition is observed in all geographical and ethnical subgroups, but it occurs with a higher tendency in more pigmented phenotypes, such as East Asians, Middle Easterners, and Mediterranean Africans [1].

The overall incidence of melasma remains unclear, but it presents an upward trend because of increased sun exposure time during leisure and daily activities, potential genetic polymorphisms due to industrialized mutagens, increased post-inflammatory hyperpigmentation, and some sex-related hormonal disturbances [2]. Pathophysiologic ally, melasma is sourced from the tripartite intersection among genetic susceptibility, environmental factors, and hormonal changes. This interaction can result in melanogenic hyperactivity and the development of epidermal hyperpigmentation [3].

Even though melasma is a widely recognized cause of significant cosmetic disfigurement worldwide, there is a lack of systematic and clinically usable treatment algorithms and guidelines for melasma management. Melasma can be difficult to treat. The pigment of melasma develops gradually and resolution is also slow [4]. Resistant cases or recurrences of melasma occur often and are certain if strict avoidance of sunlight is not rigidly heeded. Melasma is a chronic skin condition that disproportionately affects people of Asian, African, and Hispanic descent. Melasma is characterized by hyperpigmentation on sun-exposed facial skin, especially the cheeks, forehead, nose, and supralabial regions [5]. While exact mechanisms remain somewhat unclear, one theory is that ultraviolet light increases plasmin activity in keratinocytes, which leads to an increase in melanocytic-stimulating mediators, such as arachidonic acid and α-melanocyte stimulating hormone. Melasma is often associated with pregnancy, changes in uterine or ovarian hormones, oral contraceptives, hepatopathies, and cosmetic drug use. Melasma can also negatively influence quality of life and cause substantial psychological and social distress [6].

Objectives of the study

The main objective of the study is to find the topical tranexamic acid versus hydroquinone for patients presenting with melisma.

MATERIAL AND METHODS:

This descriptive study was conducted in Lahore General Hospital during June 2019 to January 2020. The data was collected from 100 patients who visited the OPD of the hospital regularly. The patients were interviewed to collect demographic and clinical data. The women were also completely examined to assess evidence of skin and physical disorders. The patients were randomly assigned via computerized randomization into two groups: group A (received TXA5% topically twice a day for 12 weeks in the location of the melasma) and group B (received hydroquinone 2% with the same treatment order). Neither patient nor physician were aware of the nature of the ordered drugs. Both groups used one type of sunscreen with SPF30. Before intervention and at 12 weeks after intervention, the intensity and extension of melasma were assessed based on the Melasma Area and Severity Index (MASI) scoring method.

For statistical analysis, results were presented as the mean ± standard deviation for quantitative variables and summarized by absolute frequencies and percentages for categorical variables.

RESULTS:

The data was collected from 100 patients. The two groups were matched for mean age (38.10 ± 6.27 vs. 39.97 ± 7.86 years, $p = 0.314$), history of receiving systemic drugs (especially thyroid drugs) (30.0% vs. 13.3%, $p = 0.117$), history of systemic disorders (13.3% vs. 6.7%, $p = 0.671$), and family history of melasma (50.0% vs. 46.7%, $p = 0.796$). With respect to the intensity and extension of disease in the two groups, the mean percentage of forehead involvement at baseline was higher in group A than in group B, whereas the areas of involvement in other locations, including left and right cheeks and chin, were similar between the groups at baseline. Similarly, no difference was found in the mean score of pigmentation and homogeneity of melasma between groups A and B before the intervention.

Table 01: The change in melasma indexes before and after treatment methods

Item	Before treatment		*P*	After treatment		*p* value
	Group TXA	Group HYD		Group TXA	Group HYD	
Extension						
Forehead	16.83 ± 4.99	12.57 ± 3.71	0.001	9.23 ± 4.11	6.83 ± 2.56	0.009
Left cheek	17.17 ± 4.85	15.33 ± 3.38	0.095	9.90 ± 4.22	7.70 ± 1.46	0.017
Right cheek	17.17 ± 4.85	15.33 ± 3.38	0.095	9.50 ± 4.28	7.70 ± 2.46	0.017
Chin	5.07 ± 1.72	4.87 ± 0.90	0.575	2.57 ± 1.16	2.80 ± 1.06	0.421
Area	4.20 ± 0.76	4.27 ± 0.78	0.780	2.57 ± 0.89	3.13 ± 0.81	0.013
Homogensity	2.00 ± 0.37	2.17 ± 0.38	0.910	1.33 ± 0.48	1.43 ± 0.57	0.464
MASI percentage	72.43 ± 20.64	65.93 ± 18.11	0.200	26.60 ± 13.43	23.73 ± 12.84	0.402

DISCUSSION:

Despite our advances with technology and new formulations of medications, melasma remains challenging to treat. Over the years, various formulations of TA have been evaluated as a means of treatment for melasma. While topical and intradermal treatments have not shown impressive results, oral TA has shown promise [7]. Future directions for research should include long-term maintenance of achieved results following the cessation of oral TA, as well as combination therapy with TA and other modalities, such as laser treatments. Newer studies on the horizon have begun to examine laser-assisted drug delivery of topical tranexamic acid. There remains a noticeable need for large-scale, randomized, placebo-controlled trials to validate the effectiveness of TA in melasma and determine the best mode of delivery [8].

Moreover, another double-blind split-face trial was performed to evaluate the efficacy and safety of topical solution of TA and compare it with combined solution of hydroquinone and dexamethasone as the gold standard treatment of melasma in Iranian women. After 12 weeks a significant decreasing trend was observed in the MASI score of both groups with no significant difference between them during the study (P<0.05) [9,10].

CONCLUSION:

It is concluded that topical use of TXA can significantly reduce both melanin level and MASI score. This regimen results in high patient satisfaction because of its high efficiency and low drug side effects.

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