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COMPARISON OF ORAL WITH INTRADERMAL TRANEXAMIC ACID FOR THE TREATMENT OF MELASMA

Dermatology

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ABSTRACT

Background: Melasma, an acquired hypermelanosis affecting sun exposed areas of the skin are mostly seen in the face and the neck. Different treatment modalities have been utilized for melasma in different studies with varying outcomes. The aim of the study was to compare the efficacy of localized intradermal microinjection of tranexamic acid with oral tranexamic acid in melasma.

Methods: It is a prospective comparative study. Patients enrolled in the study were divided into 2 groups, twenty each. In group A, patients were given intradermal injections of tranexamic acid (4 mg/ml) once at three week intervals (0, 3, 6, 9, 12 weeks) for 12 weeks. Group B patients were given oral tranexamic acid 250 mg twice a day for 12 weeks. Following parameters were evaluated before and after 12 weeks of treatment: a) MASI score b) patient subjective assessment c) dermoscopic photographs.

Results: Higher efficacy was seen with intradermal microinjection (35.6%) compared to oral tranexamic acid (21.7%). Subjective assessment showed good improvement in 63.15% cases in group A and 27.8% cases in group B.

Conclusion: Intralesional localized microinjection of tranexamic acid is a promising therapeutic modality for the treatment of resistant melasma.

KEYWORDS

Melasma, Tranexamic acid, Micro-injection

INTRODUCTION

Melasma is an acquired symmetrical hypermelanosis of the face, particularly seen in women living in areas with intense UV radiation. Though the exact etiopathogenesis is still debated, etiological factors include sun exposure, pregnancy, hormone therapy, genetic and other vascular factors.

Topical depigmenting agents, chemical peels, dermabrasion and laser therapies are utilized as treatment modalities for melasma with varying outcomes.

Tranexamic acid (TXA), a plasmin inhibitor, is now gaining traction as a popular depigmenting agent. TXA prevents plasminogen-keratinocyte binding resulting in less free arachidonic acids thereby inhibiting UV induced plasmin activity in keratinocytes. Oral TXA significantly decreases mMASI in melasma patients. Intradermal TXA is found effective against dermal and mixed variants of melasma. TXA is safe and well tolerated in the usual dosages, contraindications being acquired defective colour vision, active intravascular clotting conditions and drug hypersensitivity. In the present study, we are comparing the efficacy of localized intradermal microinjection of tranexamic acid with oral tranexamic acid in melasma patients.

METHODS

This prospective, comparative study was conducted in a tertiary care hospital with a sample size of 40, 20 in each treatment group. Adult males and females in the 18-50 age group with skin phototypes 2-5 according to Fitzpatrick's classification and clinical diagnosis of melasma were included in this study.

Patients with clotting disorders, on anticoagulant therapy, history of hormone therapy, pregnant and lactating women or history of any other treatment for depigmenting illnesses were excluded from the study.

Complete history was taken and detailed examination with regards to melasma was performed in all subjects. Wood's lamp examination was done to determine the type of melasma.

A modified MASI scoring system was used to assess the severity of the disease and assess any improvement in the condition, 12 weeks apart. Subjective assessment and dermoscopic photographs were also sought for.

The patients, divided equally into groups A and B were given either intradermal injections of tranexamic acid 0.05ml (4mg/ml) in each cm of melasma, after application of topical anaesthesia with lidocaine hydrochloride 2%, once at three week intervals (0, 3, 6, 9, 12) for 12 weeks (Group A) or oral tranexamic acid 250mg twice a day for 12 weeks. Patients were advised to use sunscreen with SPF30, applied every four hours during the day while on treatment.

Efficacy of the treatment was calculated using the formula: (mMasi score before – mMasi score after)/mMasi score before × 100.

Clinical efficacy was categorized into excellent response if more than 75% fall in the mMasi score was noted, very good with 50-75% fall, good with 25-50% fall and poor if less than 25% fall was observed.

Statistical Analysis

Mean and standard deviation was noted for continuous variables. P value less than 0.05 was considered significant.

RESULTS

Out of 40 patients, 37 completed the study, 19 in group A and 18 in group B. The most detected skin phototype was Fitzpatrick type 4. Correlating the efficacies of treatment with the demographic factors, it was found that females and patients with Fitzpatrick skin phototype 2 and 3 showed higher treatment efficacy. Younger patients showed faster improvement than the older patients.

The most common type of melasma was malar pattern. Under wood's lamp examination, epidermal type was most common.

In group A patients, mMASI score was 11.83±1.72 at the baseline and it reduced to 7.62±1.64 after 12 weeks. In group B, mMASI score reduced from baseline value of 10.61±1.59 to 8.30±1.92 after 12 weeks. Higher clinical efficacy was observed with intradermal microinjection (35.6%) compared to oral tranexamic acid (21.7%) with p value less than 0.05 (clinically significant).

Patient's global assessment showed good improvement in 63.2% of cases in group A, whereas in group B 27.8% of cases showed good improvement.

In group A, there was erythema and wheal at the site of injection in all patients which lasted for 4-6 hours. In group B, no side effects were reported.

Table 1: Age And Duration Of Disease

		Group A (n=19)	Group B (n=18)
Patient age (years)	Range	21-48	19-49
	Mean ± SD	34.0±6.40	32.6±5.90
Duration of disease (years)	Range	2-8	1-11
	Mean ± SD	5.32±2.16	6.48±3.19

Table 2: mMasi Score In Groups A And B, Before/ After Treatment = 12 Weeks

mMASI	Group A (n=19)	Group B (n=18)
Before treatment	11.83±1.72	10.61±1.59
After treatment	7.62±1.64	8.3±1.92

Percentage improvement	35.6	21.7
P value	<0.001	<0.05

Table 3: Response To Treatment In The Study Groups

Response to treatment	Group A (no. of patients)	Group A (% of patients)	Group B (no. of patients)	Group B (% of patients)
Good	12	63.2	5	27.8
Poor	5	26.3	10	55.6
No response	2	10.5	3	16.7
Total	19		18	

DISCUSSION

Tranexamic acid used for treatment of melasma was first reported in 1979 by Nijor in Japan. The oral dose of TXA used in melasma is far less than that prescribed for its hemostatic action. In randomized controlled trial study conducted by Karn et al in Nepal, oral TXA was given to patients in a dose of 250mg twice daily for 3 months. The authors concluded that it provides a rapid and sustained improvement in the treatment of melasma. Li et al studied TXA intradermally on guinea pigs and found that at the basal layer of exposed epidermis, the number of melanocytes remained the same, but the melanin content was significantly lowered. This highlights the fact that TXA affects melanin expression but not the number of melanocytes.

In group A, patients were given intradermal injection of tranexamic acid. This mode of drug delivery showed 35.6% of efficacy with good clinical response. Patient's subjective assessment showed improvement in 63.15% of cases. A Korean study with TXA (4mg/ml) administered intradermally weekly for 12 weeks showed statistically significant improvement in 75% cases.

In group B patients given oral tranexamic acid, mMASI score showed significant decrease from the baseline with clinical efficacy of 21.7%. Patient's subjective assessment showed good improvement in 27.8% cases.

The most common side effects are nausea and diarrhoea. Others include oligomenorrhoea, gastric upset and palpitations. Though used in low doses for a short duration as a systemic depigmenting agent, it is always vital to rule out underlying coagulation abnormalities to prevent untoward adverse effects. Wu et al observed a differential response of TXA on melasma patients having coexisting freckles and senile lentigo. They noted that the treatment was unresponsive to freckles and senile lentigo, whereas the melasma responded well.

CONCLUSION

Tranexamic acid is safe and well tolerated for melasma. Both intradermal and oral modes of administration are effective. Intralesional localized microinjection of Tranexamic acid is a promising therapeutic modality for the treatment of resistant melasma.

REFERENCES

1. Sarkar R, Arora P, Garg VK, Sonthalia S, Gokhale N. Melasma update. Indian Dermatol Online J. 2014;5:426-35.
2. Gupta AK, Gover MD, Nouri K, Taylor S. The treatment of melasma: A review of clinical trials. J Am Acad Dermatol. 2006;55:1048-65.
3. Bentley-Phillips B, Bayles MA.Cutaneous reactions to topical application of hydroquinone. Results of a 6-year investigation Afr Med J. 1975;49:1391-5.
4. Hurley ME, Guervara IL, Gonzales RM, Pandya AG. Efficacy of glycolic acid peels in the treatment of melasma. Arch Dermatol. 2002;138:1578-82.
5. Li YH, Chen JZ, Wei HC, Wu Y, Liu M, Xu YY, et al. Efficacy and safety of intense pulsed light in treatment of melasma in Chinese patients. Dermatol Surg. 2008;34:693-700.
6. Ando H, Matsui MS, Ichihashi M. Quasi- drugs developed in Japan for the prevention or treatment of hyperpigmentary disorders. Int J Mol Sci. 2010;11:2566-75.
7. Karn D, Kc S, Amatya A, Razouria EA, Timalsina M. Oral tranexamic acid for the treatment of melasma. Kathmandu Univ Med J (KUMJ). 2012;10:40-3.
8. Calapai G, Gangemi S, Mannucci C, Miniullo PL, Casciaro M, Calapai F. Systematic review of tranexamic acid adverse reactions. J Pharmacovigil. 2015;3:1-7.
9. Nijor T. Treatment of melasma with tranexamic acid. Clin Res. 1979;13:3129-31.
10. Malathi M, Thappa DM. Systemic skin whitening/lightening agents: What is the evidence? Indian J Dermatol Venereol Leprol. 2013;79:842-6.
11. Lee JH, Park JG, Lim SH, Kim JY, Ahn KY, et al. Localized intradermal microinjection of tranexamic acid for treatment of melasma in Asian patients: A Preliminary Clinical Trial Dermatol Surg. 2006;32:626-31.
12. Maeda K, Tomita Y. Mechanism of the inhibitory effect of tranexamic acid on melanogenesis in cultured human melanocytes in the presence of keratinocyte-conditioned medium. J Health Sci. 2007;53(4):389-96.
13. Li D, Shi Y, Li M, Liu J, Feng X. Tranexamic acid can treat ultraviolet radiation - induced pigmentation in guinea pigs. Eur J Dermatol. 2010;20:289-92.
14. Wu S, Shi H, Wu H, Yan S, Guo J, Sun Y, et al. Treatment of melasma with oral administration of tranexamic acid. Aesthetic Plast Surg. 2012;36:964-70.