Original Research Article

Melasma mystery: Oral tranexamic acid

Uday Kr Udayan¹, Pankaj Kr Tiwary²*, Ramawatar Singh³

¹Darbhanga Medical College, Darbhanga, Bihar, India
²Patna Medical College, Patna, Bihar, India
³Nalanda Medical College, Patna, Bihar, India

ARTICLE INFO

Article history:
Received 23-07-2020
Accepted 02-09-2020
Available online 03-10-2020

Keywords:
Tranexamic acid
Melasma
Pigmentation

ABSTRACT

Melasma is acquired localized hyper pigmentation of skin characterized by presence of asymptomatic light to dark brown colored macules on malar area, nose, forehead and sometimes chin. Tranexamic acid has been known for its antifibrinolytic effect through the reversible blockade of lysine binding sites on plasminogen molecules and its usage in the treatment of melasma was accidentally discovered in 1979. Patients were randomly divided into 2 groups, each consisting 70 patients. Group A patients were given oral tranexamic acid 250 mg BD along with SPF 40 sunscreen at daytime and hydroquinone 4% at night. Group B patients were given only topical treatment same as that of group A. Among group A patients decrement in mean MASI score from baseline was significant at both 12th (9.24 ± 2.8) and 16th week (8.76 ± 2.3) but not at 8th week (13.4 ± 1.7), p value was <0.05 for both 12th and 16th month. In group B decrease in MASI score was statistically insignificant at at 8th (13.1 ± 3.1) and 12th week (11.4 ± 3.5), p values being <0.05 for both. At 16 week we got significant response in group B (9.38 ± 2.8) also but comparatively less than group A. Tranexamic acid seems to be potential new medication as in various studies it has been shown to achieve melasma clearance.
3. Material and Methods

Prospective randomized controlled trial was conducted among 140 patients of clinically diagnosed moderate to severe melasma not responding to topical therapy alone. History were taken regarding any abnormal bleeding episode. Patients were investigated for bleeding time, clotting time, platelet count, those with abnormal results were excluded from the study. Patient’s age ranged from 18-51yrs (mean 31.4 ±8.2yrs). Dermascopic examination was done to assess type and extent of melasma as well as to document treatment response.

Patients were randomly divided into 2 groups, each consisting 70 patients. Group A patients were given oral tranexamic acid 250 mg BD along with SPF 40 sunscreen at daytime and hydroquinone 4% at night. Group B patients were given only topical treatment same as that of group A. Photographs were taken at baseline and follow-up. Treatment was continued for 4 months and further monthly follow up was done for another 4 months. Response was assessed on the basis of MASI score (melasma assessment severity index) decrement, which was calculated at base line, 8th, 12th and 16th week. Patients were asked about any side effect experienced by them during course of treatment.

4. Results

Mean MASI score was 14.2 ± 3.8 (Group A) and 13.9 ±3.6 (group B) at start of the treatment

| Gender | Group A | Group B |
|--------|---------|---------|
| Male   | 19      | 21      |
| Female | 51      | 49      |

| Distribution | Group A | Group B |
|--------------|---------|---------|
| Frontal      | 18      | 19      |
| Central-facial | 44    | 45      |
| Chin         | 08      | 06      |

| Type of melasma | Group A | Group B |
|-----------------|---------|---------|
| Epidermal       | 23      | 21      |
| Mixed           | 47      | 49      |

Among group A patients decrement in mean MASI score from baseline was significant at both 12th(9.24±2.8) and 16th week (8.76 ± 2.3) but not at 8th week (13.4 ±1.7), p value was <0.05 for both 12th and 16th month.(Figure 1)

In group B decrease in MASI score was statistically insignificant at 8th (13.1 ± 3.1) and 12th week (11.4 ± 3.5), p values being <0.05 for both. At 16 week we got significant response in group B (9.38±2.8) also but comparatively less than group A.

5. Discussion

In Melasma topical treatment is mainly directed at temporarily decreasing melanin synthesis by melanocytes while disease has multifactorial etiology which is only partially understood. Persistence of etiological factors leads to recurrence of lesion within short span of time resulting in patient’s dissatisfaction.

Further adding first line agent like hydroquinone has its own limitation. On pronged use it can cause ochronosis creating a resistant and helpless condition for dermatologists. Chemical peels and lasers have adjuvant role and have shown good response but results are not long lasting and affordability is major issue. Therefore effective new treatment modalities are always welcomed.

Tranexamic acid is a lysine analog and posses antiplasmin activity. Plasmin has been detected to increase arachdonic acid (prostenoid precursor) synthesis and release by endothelial cell as well as Melanocytic hormone activity. These two substance play important role in melanin synthesis by melanocytes, thus Tranexamic acid has shown
valuable response in decreasing melasma pigmentation.\textsuperscript{5–7} According to study done by Wu at al in 256 patients oral tranexamic acid had shown higher reponse (total improvement rate 80.9%) but they had given TXA for longer period of time (6 months) and side effects were also minimal like our study.

In a study conducted by Karn D et al in Nepal among 260 patients, they had prescribed oral TXA for 3 months and follow up period was also less (3 months). Subjective patient satisfaction score was also used to evaluate response. Oral Tranexamic acid has been successfully combined with IPL and Q switched NdYAG laser in a study conducted by Cho HH et al with no serious side effects.

In our study efficacy and side effect profile of TXA corresponded with related studies except that we had higher number of recurrences during end of follow up period.

6. Conclusion
Tranexamic acid seems to be potential new medication as in various studies it has been shown to achieve melasma clearance, although durability of response is still questionable. Molecule is yet to be fully explored so that maximum effective and safe dose could be given according to an optimum regimen.

7. Source of Funding
None.

8. Conflict of Interest
None.

References
1. Dunn CJ, Goa KL. Tranexamic acid: a review of its use in surgery and other indications. \textit{Drugs}. 1999;57(6):1005–32.
2. Wellington K, Wagstaff AJ. Tranexamic acid: a review of its use in the management of menorrhagia. \textit{Drugs}. 2003;63(13):1417–33.
3. Nijo T. Treatment of melasma with tranexamic acid. \textit{Clin Rev.} 1979;13:31293131.
4. Kimbrough-Green CK, Griffiths C, Finkel LJ, Hamilton TA, Bulengo-Ransby SM. Topical retinoic acid (tretinoin) for melasma in black patients. \textit{Arch Dermatol.} 1994;130:727–33.
5. Wang N, Zhang L, Miles L, Hoover-Plow J. Plasminogen regulates pro-opiomelanocortin processing. \textit{J Thromb Haemost.} 2004;2(5):785–96.
6. Chang WC, Shi GY, Chow YH, Chang LC, Hau JS, Lin MT, et al. Human plasmin induces a receptor-mediated arachidonate release coupled with G proteins in endothelial cells. \textit{Am J Physiol-Cell Physiol.} 1993;264(2):C271–81.
7. Ando H, Matsui MS, Ichihashi M. Addendum: Quasi-Drugs Developed in Japan for the Prevention or Treatment of Hyperpigmentary Disorders. \textit{Int. J. Mol. Sci.} 2010, 11, 2566–2575. \textit{Int J Mol Sci.} 2010;11(7):2699–700.

Author biography
Uday Kr Udayan Assistant Professor
Pankaj Kr Tiwary Assistant Professor
Ramawatar Singh Assistant Professor

Cite this article: Udayan UK, Tiwary PK, Singh R. Melasma mystery: Oral tranexamic acid. \textit{IP Indian J Clin Exp Dermatol} 2020;6(3):254-256.