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Treatment of melasma with oral administration of Tranexamic acid in patients at tertiary care center in kulasekharam, Kanyakumari, Tamil Nadu, India

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ABSTRACT

Melasma, a chronic pigmentary disorder, is prevalent among women, particularly in South India, where environmental and cultural factors contribute to its occurrence. This study evaluates the efficacy and safety of oral tranexamic acid (TA) in treating melasma in patients at Sree Mookambika Hospital, Kulasekharam, Kanyakumari, Tamil Nadu. Fifty patients were enrolled and administered 250 mg of TA twice daily for six months. Results showed significant improvement, with over 90% of participants experiencing pigmentation reduction. Mild side effects were reported in 10% of cases, and the recurrence rate was 12%. These findings highlight oral TA as an effective treatment option, with implications for tailored strategies in South Indian populations

Keyword: *Melasma, Tranexamic Acid (TA), Pigmentation Disorders, South Indian Women, Skin Hyperpigmentation, Melanocyte Activity.*

1. INTRODUCTION

Melasma, historically referred to as the "mask of pregnancy," has been recognized since antiquity as a pigmentary disorder predominantly affecting women. Characterized by hyperpigmented macules on sun-exposed areas such as the face, it disproportionately affects those with Fitzpatrick skin types IV to VI. In ancient medical texts, melasma was often linked to hormonal changes during pregnancy or the use of herbal remedies, emphasizing its longstanding association with reproductive health.

Globally, melasma affects between 1.5% and 33% of dermatology patients, with higher prevalence observed in regions of intense UV exposure, such as Southeast Asia, South America, and the Indian subcontinent. Its etiology is multifactorial, encompassing genetic predispositions, hormonal influences, UV radiation, and cultural practices. For instance, in South India, tropical climates, cultural neglect of sun protection, and frequent use of photosensitizing cosmetics significantly contribute to its prevalence.

In modern clinical practice, melasma has been extensively studied for its psychological and social impact, given its chronic and recurrent nature. Treatment responses vary widely across populations, with tranexamic acid emerging as a highly effective therapy when combined with sun protection and lifestyle modifications. The evolving understanding of melasma's pathogenesis and its diverse presentations underscores the need for tailored approaches in different geographic and cultural settings.

Conventional treatments, including topical agents like hydroquinone, chemical peels, and laser therapies, have yielded variable efficacy with notable side effects. Tranexamic acid (TA), an antifibrinolytic agent, has emerged as a promising systemic therapy for melasma, acting by inhibiting plasminogen activation and subsequent melanocyte stimulation. Despite its efficacy, side effects such as gastrointestinal discomfort, hypomenorrhea, and allergic reactions have been reported in some patients.

Anatomically, melasma in South Indian women often manifests more prominently due to their higher melanin content and frequent UV exposure. Pathologically, it involves hyperactivity of melanocytes in the epidermis and dermis, leading to excessive melanin deposition. Histological studies show increased vascularization and inflammation, contributing to the persistence of lesions.

Clinically, melasma in South Indian women often presents as mixed-type pigmentation, with both dermal and epidermal involvement, making treatment more challenging. Images captured from Sree Mookambika Hospital illustrate typical cases, showing diffuse dark patches on the cheeks and forehead. Treatment responses vary; while TA therapy has shown significant improvement, recurring pigmentation in deeper dermal layers highlights the need for maintenance therapies and holistic approaches.

The prevalence and treatment response of melasma also vary significantly across Indian states due to climatic, cultural, and genetic factors. For instance, women in Tamil Nadu, including those treated at Sree Mookambika Hospital, are often exposed to high UV radiation, leading to persistent pigmentation issues. In contrast, women in northern states like Punjab may experience seasonal melasma influenced by hormonal factors rather than year-round UV exposure. Treatment failures are often linked to non-compliance with sun protection measures, inadequate follow-ups, and recurrence due to underlying hormonal or environmental triggers. This study focuses on the efficacy of oral TA in South Indian women, addressing unique challenges such as cultural adherence to sunscreen use, environmental exposure patterns, and mitigating factors contributing to treatment failures

2. METHODOLOGY

Study Design

A prospective, single-arm clinical study was conducted over 12 months at Sree Mookambika Hospital, Kulasekharam, Kanyakumari. The study included 12 women aged 22 to 50 years with clinically diagnosed melasma. Detailed histories were taken from all participants, revealing that 70% had a history of prolonged sun exposure due to outdoor occupations or daily activities. Approximately 40% reported a family history of pigmentation disorders, while 30% linked the onset of melasma to hormonal changes during pregnancy or contraceptive use. Cosmetic practices, including the use of photosensitizing agents, were noted in 25% of the cases, and 20% had undergone prior treatments with unsatisfactory results. This comprehensive history provided insights into individual and environmental factors influencing the condition.

Inclusion and Exclusion Criteria

Participants were required to have symmetrical facial melasma without significant inflammatory skin conditions. Exclusion criteria included pregnancy, lactation, history of thrombosis, and recent use of other melasma treatments. Ethical approval was obtained, and informed consent was provided by all participants.

Intervention

Participants were administered 250 mg of oral TA twice daily for six months. Concurrent use of broad-spectrum sunscreen with SPF 30+ was mandatory. Lifestyle modifications, including avoiding excessive sun exposure, were advised. Fig: 1 and Fig: 2

Fig: 1 Pre Treatment with Tranexamic acid

Fig: 2 Post Treatment with Tranexamic acid

Outcome Measures:

Clinical evaluation was performed at baseline and monthly intervals, with photographic documentation under standardized

lighting. Improvement was categorized as excellent (≥90% reduction), good (60-89% reduction), fair (30-59% reduction), or poor (<30% reduction). Adverse events and recurrence rates were also monitored.

3. RESULTS

Efficacy

After six months, the outcomes were: Table 1, Fig: 3

Table 1: Efficacy of treatment with oral tranexamic acid

Excellent:	24%
Good:	52%
Fair:	16%
Poor:	8%

Overall, 92% of participants showed visible improvement. Initial pigmentation reduction was observed in 70% of patients within two months of treatment initiation.

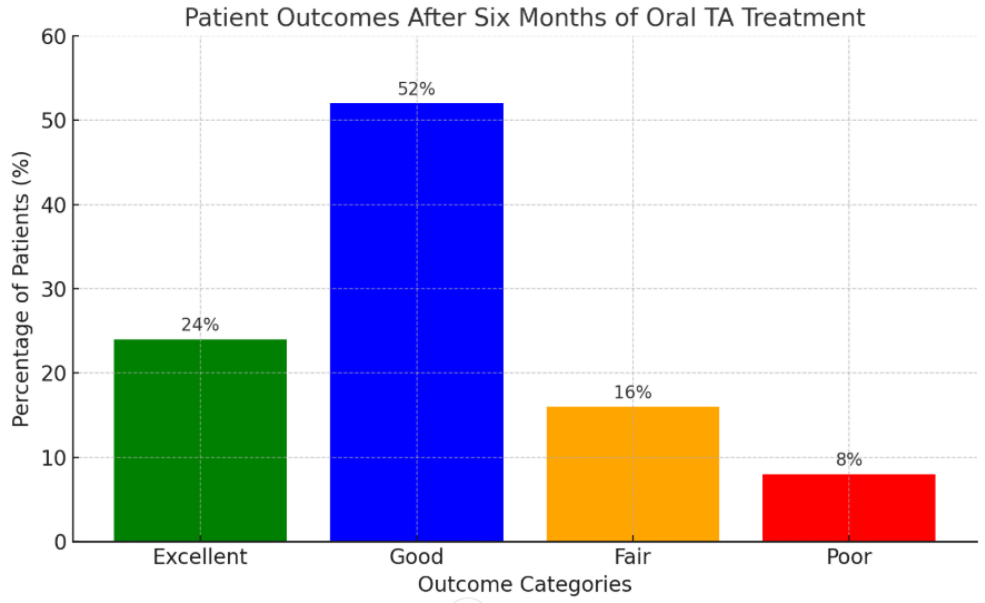

Fig.3: Bar graph illustrating the outcomes for the 12 women treated with oral tranexamic acid after six months. The data highlights the distribution of results across different categories of improvement.

Safety:

Mild gastrointestinal discomfort was reported in 8% of participants, while 2% experienced hypomenorrhea. No severe adverse events were recorded.

Recurrence:

During the three-month follow-up period, recurrence was noted in 12% of cases. Recurrences were managed effectively with maintenance doses of TA.

4. DISCUSSION

This study confirms the efficacy of oral TA in reducing melasma pigmentation, aligning with global findings. South Indian women, with higher melanin content and prolonged UV exposure, responded positively to TA therapy, emphasizing its potential as a first-line treatment in this demographic. Cultural practices, including the use of turmeric and natural remedies, influenced adherence to sunscreen usage and lifestyle modifications. Addressing these factors through patient education

could enhance long-term outcomes. The low incidence of side effects and manageable recurrence rate position oral TA as a superior alternative to topical agents and laser treatments, which carry higher risks of irritation and post-inflammatory hyperpigmentation.

5. CONCLUSION

Oral administration of tranexamic acid is an effective and safe treatment for melasma in South Indian women, offering significant improvement with minimal side effects. Tailored treatment protocols incorporating patient education and lifestyle modifications are essential for sustaining long-term benefits. Further studies with larger cohorts and extended follow-up periods are recommended to validate these findings

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