THE EFFECTIVENESS OF THE USE OF TRANEXAMIC ACID PREPARATIONS AGAINST MELASMA SKIN IN THE DERMATO CLINIC BANDUNG

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Abstract

This study aims to assess the effectiveness of Tranexamic Acid usage on melasma skin at the Dermato Clinic in Bandung. The research methodology employed is qualitative research based on literature review and observation, conducted through visual or objective assessments of patients with melasma issues. In this study, four patients were chosen as research subjects and observed periodically over a period of six to eight weeks. The results obtained during the observation period indicated a reduction in melasma levels, which could be observed visually or objectively, as well as through the Melasma Area and Severity Index (MASI) score. Issues identified in this research include: (1) difficulty in monitoring sunscreen application, leading to inhibited recovery processes, and (2) variation in injection timing among subjects. Recommendations to address these issues include: (1) regular sunscreen application every three hours to prevent exacerbating melasma conditions, (2) consistent treatment protocols for all research subjects, and (3) extending the research duration to yield more significant results.

Keywords: Tranexamic acid; Melasma; Melasma Area and Severity Index.

INTRODUCTION

Human skin color is determined by the pigment melanin, produced by melanocytes in the epidermis. There are two types of melanin: (1) **Eumelanin**, responsible for brown and black skin tones, providing more protection against UV radiation, and (2) **Pheomelanin**, contributing to red and yellow skin tones, less effective in UV protection (Henny Apriani, 2017).

Melanin production is influenced by genetic factors and environmental factors such as sun exposure. Hormonal changes, particularly during pregnancy, can increase melanin production, resulting in melasma (Adelia Suryani, 2020).

Melasma is a skin disorder commonly affecting women, characterized by irregular brown patches, prevalent in tropical regions (Pravitasari et al., 2012). Typically occurring on the face, it can also appear on the neck, chest, and upper extremities. Most cases are seen in women, with approximately 20% occurring in men (Sarkar et al., 2018).

The literature discussing melasma in Indonesia is still limited, which results in this skin condition being relatively unknown to the public. Consequently,

melasma is often not perceived as a health issue that needs to be addressed. Melasma is also a cosmetic problem that troubles those affected by it, often causing significant social and psychological impacts due to the visible appearance of light brown to dark brown patches, which are easily noticeable.

Melasma is a chronic acquired hypermelanosis localized on the skin, characterized by light to dark brown macules and symmetric patches involving sun-exposed areas of the face, neck, and occasionally the forearms. This condition is commonly found in women of reproductive age, rarely in postmenopausal women, and in men (10% of cases). Several factors contribute to the pathogenesis of melasma, including genetic predisposition, UV exposure, pregnancy, hormones, contraceptive pills, thyroid disease, cosmetics, and phototoxic drugs (antiepileptics). (Lucky Pratama et al., 2022).

The treatment of melasma generally begins with preventing risk factors, protecting against UV radiation, and reducing lesions with minimal side effects. The principles of therapy include inhibiting the melanin synthesis pathway, reducing the transfer of melanosomes from melanocytes to keratinocytes, and accelerating the melanin clearance pathway (Trivedi et al., 2017). Laser therapy, which targets melanin in the skin, can be used for treating melasma. The laser energy absorbed by melanin causes the melanosomes (where melanin is located) to break and become damaged, thereby reducing skin pigmentation (Susie Rendra, MD, 2024). There is also therapy using active substances to minimize or treat melasma, such as tranexamic acid.

Tranexamic acid is commonly used as an active ingredient to stop bleeding, and it can also be administered via injection, orally, or topically as a medication for skin diseases with minimal side effects. Tranexamic acid works by preventing sun-induced pigmentation by disrupting the structure of plasminogen and blocking the binding of plasminogen to lysine binding sites on keratinocytes. As a plasmin inhibitor, tranexamic acid suppresses angiogenesis and inhibits the induction of new blood vessels by fibroblast basic growth factor (bFGF), which contributes to the mechanism of treating melasma. Another mechanism of action of tranexamic acid is reducing hyperpigmentation through the blockade of the APu-IT pathway (Marinda Nur Triyanti, 2022).

Based on the lack of understanding among patients regarding the skin condition melasma, the limited use of tranexamic acid preparations, and the scarcity of literature in Indonesia discussing the use of tranexamic acid preparations for treating melasma, the author decided to conduct research titled "THE EFFECTIVENESS OF THE USE OF TRANEXAMIC ACID PREPARATIONS AGAINTS MELASMA SKIN IN THE DERMATO CLINIC BANDUNG."

RESEARCH METHOD

The qualitative analysis method is the method used by the researcher. According to Strauss and Corbin (2007:1), this qualitative research is a method that can be used to examine societal life, history, behavior, organizational functioning, social movements, or kinship relationships.

The qualitative analysis method is a method conducted by the researcher.

According to Sugiyono (2018), qualitative research is a method based on post-positivist philosophy used to investigate scientific conditions where the researcher is the instrument, and data collection techniques and analyses emphasize qualitative meaning.

In the research conducted, the researcher observed the researched objects to directly observe a detailed description or depiction of the problem, which must be clear and objective. Therefore, the researcher selected a population consisting of the number of patient data using Tranexamic Acid injection preparations for melasma skin condition in March 2024, totaling 4 individuals.

The computational method utilized in this analysis employs the Melasma Area and Severity Index (MASI), wherein measurements are contingent upon four regions: the frontal area (F) with a weightage of 30%; the right and left malar regions (RMR and LMR) each allocated 30%; and the mentum (M) with a weightage of 10%. Furthermore, the extent of melasma involvement (A) is graded from 0 to 6, adhering to the following criteria;

Grade	The degree of melanin pigmentation
0	There is no degree of melanin pigmentation
1	<10%
2	10-29%
3	30-49%
4	50-69%
5	70-89%
6	90-100%

Table 1.

Criteria of the degree of melanin

Additionally, the calculation includes the degree of pigmentation (P) and homogeneity (H), each evaluated on a scale from 0 to 4 according to the following criteria;

Scale	Criteria
0	none
1	slight
2	mild
3	marked
4	maximum

Table 2.

Score of degree of pigmentation (P) and homogeneity (H)

then calculated using the MASI score formula;MASI score= 0.3A(F)[P(F) + H(F)] + 0.3A(RMR)[P(RMR) + H(RMR)] + 0.3A(LMR)[P(LMR) + H(LMR)] + 0.1A(M) [P(M) + H(M)]

This measurement is subjective, requiring the physician to estimate the score based on their impression of the patient's melasma.

RESULT AND DISCUSSION

Based on the observations made by the researcher during the period of March-April 2024, the following findings were noted:

1. Research Subject 1:

For research subject 1, with the treatment of a single Tranexamic Acid injection, observations were conducted over a period of 6 weeks.

Picture 1. *Research subject 1*

Based on the calculations using the MASI (Melasma Area and Severity Index) score, the initial MASI score was 1.2, and the MASI index after 6 weeks of observation was 1.2. According to the MASI score calculations, there was no reduction. However, through visual/objective observation, there was a slight change, such as the fading of the melasma color in research subject 1.

2. Research Subject 2:

For research subject 2, with the treatment of two Tranexamic Acid injections, observations were conducted over a period of 6 weeks .

Picture 2. *Research subject 2*

Picture 3. *Research subject 2 with dermoscopy*

Based on the calculations using the MASI (Melasma Area and Severity Index) score, the initial MASI score was 3.2, and the MASI index after 6 weeks of observation was 2. This calculation shows a reduction in the MASI score by 37.5%.

3. Research Subject 3

For research subject 3, with the treatment of three Tranexamic Acid injections, observations were conducted over a period of 6 weeks.

Picture 4. *Research subject 3*

Based on the calculations using the MASI (Melasma Area and Severity Index) score, the initial MASI score was 2.6, and the MASI index after 6 weeks of observation was 1.7. This calculation shows a reduction in the MASI score by 34.6%.

4. Research Subject 4

For research subject 4, with the treatment of four Tranexamic Acid injections, observations were conducted over a period of 8 weeks.

Picture 5. *Research subject 4*

Picture 6. *Research subject 4 with dermoscopy*

Based on the calculations using the MASI (Melasma Area and Severity Index) score, the initial MASI score was 4.85 , and the MASI index after 8 weeks of observation was 3.2. This calculation shows a reduction in the MASI score by 34.02%.

From the observations conducted from March to April 2024, there were different treatments administered to each research subject, which consequently influenced the research outcomes. In addition to the varied treatments given to each research subject, the use of sunscreen and the amount of sun exposure also impacted the results of these observations.

Conclusion

There were changes observed in each research subject that could be visually/objectively observed, as well as changes in the calculation of the MASI (Melasma Area and Severity Index) score. However, some changes may not have been significant enough to be captured by the MASI calculation.

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