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ORIGINAL RESEARCH ARTICLE

Clinical Comparison of Azelaic Acid 20% *versus* Hydroquinone 4% in the Treatment of Melasma

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ABSTRACT

Introduction: Whitening agents that are used in the treatment of cholasma are different with variable results. Hydroquinone and azelaic acid are both characterized by their inhibitory effects on tyrosinase enzymes. This study was conducted to compare the post-treatment success of hydroquinone versus azelaic acid.

Materials and Methods: This is a single blind-randomized clinical trial study. Patients were randomized in a single-blind manner. Fifty patients with malar and centrofacial melasma were randomized. A total of 25 patients received hydroquinone and 25 other received azelaic acid for ten weeks. Treatment success were evaluated by skin color lightening observation through melasma area severity index (MASI) and dermoscopy.

Results: Hydroquinone-used patients were showed more pigmentation improvement than azelaic acid used patients, 61% of patients who were used hydroquinone showed good to excellent improvement and 31% of them experienced side effects. The azelaic acid used group responded well in 34% of patients, but side effects were experienced just by 21% of patients.

Conclusion: Hydroquinone induces great improvement. However, side effects such as irritation and redness are common to occur.

Keywords: Melasma, Hydroquinone, Azelaic acid, Tyrosinase, Dermascope, Treatment, Melasma.

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INTRODUCTION

Melasma is a common hypermelanosis that affects sun-exposed areas and occur frequently in women who are 4 or 5 skin photo types, and rarely men affected. Melasma may affect the epidermis or dermis layer of the skin. Risk factors are oral contraceptives and pregnancy, and most common factor that induces melasma is ultraviolet sunlight, so it is important for patients to take photoprotective measures. Hydroquinone is best treatment choice for the treatment of melasma. This tyrosinase inhibitor usually induces side effects but moderate improvement is observed in up to 79% of patients.[1]

Azelaic acid demonstrated a suppression of melanin production, which lead to the reduction of melanin in epidermal cells. However, its therapeutic efficacy is rarely reported. Azelaic acid is also regarded as an anti-inflammatory agent, this characteristic leading to its usage in Rosacea,[2-5] this trial was conducted to clinically compare the efficacy and safety HQ 4% and azelaic acid 20% in the treatment of melisma.

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MATERIALS AND METHODS

This is clinical comparison trail, the proposal was approved by the Dermatology Department and Research Committee of Nangarhar Medical Faculty, and each subject was registered at Nangarhar University Teaching Hospital. Sample size determination was determined according to a favorable response for hydroquinone and azelaic acid.

Considering our inclusion and exclusion criteria, 50 women who attended OPD of the Dermatology Department at Nangarhar University Teaching Hospital from March 2021 to September 2022.

The inclusion criteria for this trial were women above 16 years old without topical, laser, or surgical treatment on the face during the previous year. The exclusion criteria were pregnant and nursing women, patients with a history of hypersensitivity to some of the components of the formulas of the study, and the coexistence of associate diseases and other pigmentation diseases.

We used a magnifying lamp and dermoscopy to evaluate the patients. Dermoscopy helped us to got 100% magnification and clear view. We also used Wood's lamp to assess the type of melasma. We selected patients with epidermal melasma. The therapeutic response of epidermal melasma, other two types of melasma, which are derma and mix not good responsive for topical treatment,

Patients were randomized in a single-blind manner. A total of 25 patients received hydroquinone 4 cream and 25% other received azelaic acid 20% cream. We instructed patients to apply the creams correctly once nightly and how to take photoprotective measures.

Other whitening and lightening creams and systemic treatments was not allowed. Duration for this treatment was 10 weeks, with evaluation and follow-up at 5 and 10 weeks of infrared thermography with a photographic register which mainly was used to detect irritation, patients or their family members recorded photography due to cultural circumstances. All side effects were registered.

RESULTS

In this trial melasma were included with 50 women, type four and fifth skin photo type of pitzpatric. The pattern of melasma was mandibular in 25 to 50% centrofacial in 16 to 32% and malar in 8 to 18% according to photo types 34 to (68 were type 4 skin, and 16 to 32 of type 5.

According to age patients ranged 20 to 45, and the affecting time of these patients by melasma varied from 1 to 5 years (mean 2 ± 5). Most common precipitating factor was sun exposure.

According to our result assessment the azelaic acid group improvement as excellent in 3 patients, good in 5, moderate in 9, and mild in 8. The hydroquinone-treated group improvement as excellent in 5, good in 8, moderate in 7, and mild in 5 patients (Figure 1). Initial mean melasma area and severity index (MASI) score for the hydroquinone cases was 7.4 (95% CI 5.3–9.3) and 10 week treatment statistic change was mean 1.06 (95% CI 0.6–1.4) with (*p-value* 0.01) for patients who received azelaic acids initial mean was 8.79 (95% CI 7.2–9.8) after 10 weeks treatment the was 2.4 (9% CI 3.1–6.2) *p-value* 0.01. After 5 weeks of treatment with hydroquinone and azelaic acid pigmentation decreased and lightening of the skin was visible, at 10 weeks lightening was more increased. Patients treated with HQ 4% experienced more intense erythema and burning compared to azelaic acid. According to wood lamp examination, there was a contrast increase in all the subjects.

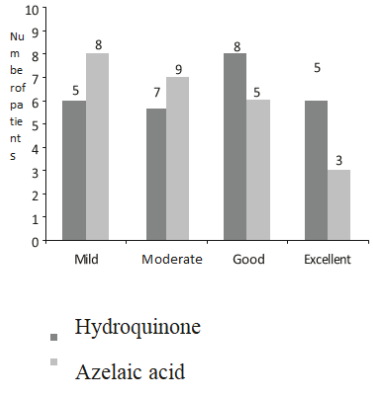

Figure 1: Result assessment in melasma patients with hydroquinone versus azelaic acid

DISCUSSION

Melasma is a common hyper melanosis that affects sun-exposed areas. The high rate of relapses challenges therapeutic measures for melasma, our study showed that HQ 4% is a favorable and effective choice for the treatment of melasma. We assessed by dermoscopy, wood lamp and clinical evaluation. We found that 4% hydroquinone was effective in 53% of patients. some technical problems were during conducting our study like biopsy was not avialabe, which was important for more clearance about the drug's effects. Further studying about the hydroquinone effects on melanin production are necessary. In the first month of treatment, the lightening effect of hydroquinone was evident, but with azelaic acid this happened after two months of treatment. A total of 33% of patients who used hydroquinone showed side effects that were moderate in severity, but with azelaic acid side effects were milder and was experienced by just 11% of patients. Patients treated with azelaic acid showed less side effects and well tolerated. So, it can be used for a longer period of time as initial or maintenance therapy. We suggest further study to assess the combined usage of azelaic acid with other topical agents and assess its additive effects, action mechanism of azelaic acid in hypermelanosis could be by inhibition of tyrosinase enzyme. Photoprotection actions,[6-8] and its anti-inflammatory properties.[4,9,10] It is clearly described that inflammatory mediators like interleukin 1,6 and prostaglandin are causes melanin overproduction through stimulation of the tyrosinase enzyme.[6,11] According to this trail findings, it was to prove an intervention capable of inducing modifications to these atypical findings related in the pathogenesis of melasma. Therefore, this is to suggest that azelaic acid efficacy is less but with less side effects, compared to hydroquinone, which has rapid and good effects but with more irritation.

CONCLUSION

The study concluded that hydroquinone induces an excellent decrease of pigmentation. However, side effects such as irritation and redness are common to azelaic acid is relatively less effective and a longer period of treatment is necessary.

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