What's New in Objective Assessment and Treatment of Facial Hyperpigmentation?

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KEYWORDS

• Melasma • Postinflammatory hyperpigmentation • Dermatosis papulosa nigra
• Lichen planus pigmentosus • Erythema dyschromicum perstans
• Objective assessment of pigmentation • Treatment

KEY POINTS

- Facial hyperpigmentation is common and disfiguring in people of African ancestry.
- Melasma is the most studied with validated severity scoring tools; however, combination treatments are often required to improve efficacy.
- More work is required to develop and validate severity scoring tools and to elucidate effective treatments for postinflammatory hyperpigmentation and lichen planus pigmentosus.

INTRODUCTION

Hyperpigmentation, which commonly affects dark-skinned individuals, is often challenging to treat. Disorders of hyperpigmentation have been demonstrated to have a negative impact on quality of life.[1] Pigmentary disorders occur with greater frequency and severity in black populations and are a frequent reason for dermatologic consultation.[1–3] Halder and Nootheti[4] reported that pigmentary disorders (excluding vitiligo) were the third most common reason for dermatologic consultation among African American patients.[4] In a 2005 study by Alexis and colleagues,[5] pigmentary disorders ranked second in the 5 top diagnoses (acne, dyschromia, eczema, alopecia, and seborrheic dermatitis) in the black population.

Facial pigmentary disorders that are of greatest concern are melasma, postinflammatory hyper- or hypopigmentation, dermatosis papulosis nigra (DPN), seborrheic keratosis, lichen planus pigmentosus, and erythema dyschromicum perstans (EDP).[1,2]

OBJECTIVE ASSESSMENT—MELASMA

Clinical Findings

Melasma is characterized by irregular brown patches on sun-exposed skin, most commonly involving malar prominences, the forehead, the upper lip, the nose, and the chin (**Fig. 1**).[1,6] As discussed by Sheth and Pandya,[6] the centrofacial pattern is the most common pattern, characterized by lesions on the forehead, cheeks, nose, upper lip, or chin. The malar pattern consists of lesions primarily on cheeks and nose. The mandibular pattern consists of lesions on the ramus of the mandible.

Severity Scales

The Melasma Area and Severity Index (MASI) score is an outcome measure first developed and implemented by Kimbrough-Green and

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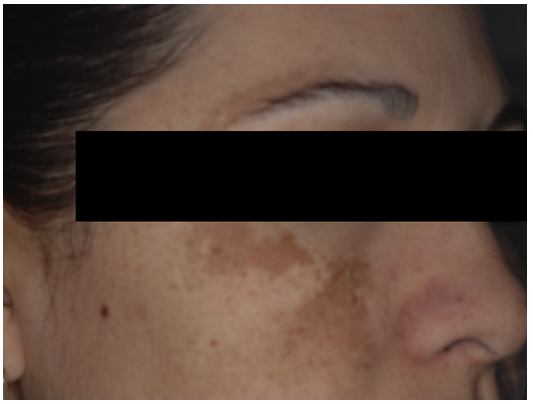

Fig. 1. Melasma of right cheek.

colleagues.[7] This index was based on a similar scoring system devised for psoriasis. The score is calculated by adding the sum of severity ratings for darkness and homogeneity, which is then multiplied by a value representing the area of involvement, for each of 4 facial areas, with a total score ranging from 0 to 48. The MASI is the most commonly used outcome measure for melasma trials, but, until recently, it had never been validated. A prospective study conducted by Pandya and colleagues[8] found that although the MASI demonstrated good reliability within and between raters, there were problems with 2 individual components of the MASI, namely the assessment of the chin and homogeneity of melasma lesions. Validation was performed by comparing the MASI with the melasma severity scale, mexameter scores, and area measurements. Homogeneity was the most difficult component to assess reliably. The researchers found that by removing the homogeneity parameter from the MASI, reliability and validity were not altered. Thus, the authors recommended removal of homogeneity from the MASI score altogether. Removal of the assessment of the chin was not recommended because it only represented 10% of the overall score, and variations in assessment of this area did not cause the MASI score to change significantly. This new assessment tool has been termed the modified MASI score and scores range from 0 to 24. Future studies are needed to assess the sensitivity of the modified MASI in objectively assessing change in melasma over time with treatment. The Taylor hyperpigmentation scale[9] was developed to assess hyperpigmentation in both a research and a clinical setting, requires minimal training, is easy to administer, and is inexpensive to perform. There are a possible of 100 different ratings using this scale, consisting of a series of laminated plastic cards that are printed in 10 different skin colors (S = J) and 10 gradations of pigment for each skin type. In a pilot study using 24 subjects with Fitzpatrick skin types III–IV, the scale scored well for "ease of use" and "usefulness" for 8 of 10 evaluators. Six of 10 clinicians stated the scale had too few choices of skin color or hue, and 2 of 10 stated there were too many choices. Their feedback prompted the development of a modified scale that includes 15 skin hues or colors representing skin types I–IV.

Polarized light photography is useful in the assessment of dermal changes, including dermal melasma; however, it may be less useful in the assessment of epidermal pigmentation.[10] Accurate and reproducible readings of melasma can be obtained for the objective measurement of skin color with hand-held tristimulus reflectance colorimeters, such as the Photovolt Color Walk Colorimeter (Photovolt instruments, Minneapolis, MN, USA) and the Minolta Chromameter (Minolta, Osaka, Japan), as well as narrowband reflectance spectrophotometers such as DermaSpectrophotometer and the Mexameter. A previous study comparing the Minolta Chromameter, DermaSpectrophotometer (Cortex Technologies, Hadsund, Denmark), and the Mexameter demonstrated good day-to-day repeatability in melanin measurement (1% variability) for both the Chromameter and the Mexameter, but poor repeatability for the DermaSpectrometer (4% variability).[11] The authors found that all 3 instruments were able to characterize and quantify small changes in skin color. In addition, the investigators agreed with previous findings that the Chromameter was capable of measuring all colors, whereas reflectance spectrophotometers were effective at measuring intensity of erythema and melanin-induced pigmentation.[10,11] The use of reflectance spectroscopy in objectively determining the relationship between the L* value (Color Walk Colorimeter) and M index (DermaSpectrophotometer) has been previously investigated.[12] African American subjects with the darkest skin had the lowest L* values and the highest M indices, whereas the subjects of European ancestry with the lightest skin had high L* values and low M indices.

Finally, several techniques are now available for the objective assessment of pigmentation in melasma. Together with scoring methods to quantify subjective evaluations better, reliable outcome measures that can be used in melasma studies to produce reproducible results are now available.

PHARMACOLOGIC TREATMENT OPTIONS: MELASMA

Although multiple studies have focused on developing new therapies for treatment of melasma,