

# Melasma's Impact on Quality of Life

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## ABSTRACT

Melasma is a commonly acquired condition that mostly affects women with Fitzpatrick skin types III-VI with prominent brown pigmentation with or without an underlying erythema. Despite multiple treatment options, melasma can be challenging given its chronic and relapsing nature. The objective of this article is to review the quality of life impact of melasma and offer suggestions for enhancing the melasma specific quality of life scale.

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## INTRODUCTION

Melasma is a commonly acquired hyperpigmentation disorder that most frequently occurs in women with Fitzpatrick skin types III-VI with an average onset between 20-30 years of age.<sup>1,2,3</sup> The most commonly affected groups include Hispanic, Asian, and patients of African descent in areas with more intense UV exposure.<sup>1,4</sup> Men can also be affected by the condition, but account for less than twenty percent.<sup>1,3</sup> In the United States alone, over 5 million people are affected by melasma.<sup>4</sup> The etiology is multifactorial with several known exacerbating factors including pregnancy, hormonal contraceptives, intense UV exposure, and thyroid disorders.<sup>1,4</sup> Interestingly in a study in Argentinian women that developed melasma during pregnancy or while taking oral contraceptives, there was a 70% incidence of thyroid abnormalities.<sup>5</sup> Less commonly, phototoxic medications, cosmetics (especially those that contain oil of bergamot as a masking fragrance), and stress have also been cited as exacerbating factors.<sup>4,6</sup> Melasma is characterized by irregularly shaped light to dark brown macules and patches with a symmetric distribution most commonly on the malar region, chin, and forehead.<sup>1,4</sup> Underlying hypervascularity may occur in a significant number of patients.<sup>7,8</sup>

The centrofacial pattern is the most common form of melasma that has a distribution of hyperpigmented patches on the forehead, cheeks, upper lip, and nose.<sup>4</sup> The less common mandibular pattern of melasma is characterized by hyperpigmented patches along the mandible ramus and tends to occur later in life with women more commonly presenting in their forties.<sup>2</sup> There is some speculation that the mandibular subtype of melasma should instead be considered a form of poikiloderma of Civatte since this pattern often occurs in postmenopausal women with signs of actinic damage.<sup>4</sup> Non-facial melasma, which is more commonly seen in postmenopausal women, has also been reported to affect the forearms and upper back.<sup>1,4,9</sup>

Increased erythema and telangiectasias suggest that there may be a vascular component to melasma while another smaller study suggests neural involvement as a possibility.<sup>1,4,7</sup>

## Etiology/Pathogenesis

Melasma is a complex multifactorial condition that has a genetic predisposition. The pathogenesis is not fully understood, but increased stem cell factor, which binds the tyrosine kinase receptor, c-kit, has been shown to play a role.<sup>1,2</sup> Alterations in Wnt signaling pathway,  $\alpha$ -melanocyte-stimulating hormone, barrier dysfunction, increased oxidative stress, increased mast cells, and fatty acid abnormalities have also been implicated.<sup>1,2,10</sup> Furthermore, visible light has been noted to play a role in worsening melasma. In fact, one study examined hyperpigmentation at 7 time points over two weeks and noted that darker skin types had a darker and more sustained hyperpigmentation from visible light when compared to UVA1.<sup>11</sup> Another study showed sustained pigmentation from visible light wavelength 415 nm after less than two hours of sun exposure.<sup>2,11,12</sup> Melasma also has a vascular component that could influence pigmentation. Specifically, vascular endothelial growth factor is an angiogenic growth factor that is the likely cause of increased vascularity within melasma patches.<sup>7</sup>

## Epidemiology

Melasma is a skin condition that affects men and women of many different skin types. Prevalence of melasma ranges from 8.8% in Latina women in the United States to up to 40% of women and 20% of men in Southeast Asia.<sup>4,13</sup> A survey of Arab-American women living in the United States found melasma to be the 5th most common skin condition affecting 14.5% of people, while another multicenter study found that African Americans were more likely to have a positive family history.<sup>4,14,15</sup>

### Histology

Histological features of melasma include epidermal and dermal melanin with varying quantities related to the severity of the hyperpigmentation. There is no increase in melanocytes but there is an increase in the number of melanosomes, size of the cells, and elongation of dendrites.<sup>1</sup> It was initially thought that areas that illuminate under a Woods lamp have epidermal involvement while areas that do not light up have dermal involvement. However, more recent research suggests that this may not be completely accurate.<sup>4,16</sup> Other histologic features of melasma include an increase in mast cells, solar elastosis, and dermal blood vessels.<sup>1</sup>

### Treatment

The treatment of melasma requires a multimodal approach with a focus on skin lightening, improving the vascular component and strict broad spectrum photoprotection. High protection factor sunscreen decreases the intensity of melasma and reduces the incidence during pregnancy by over 90%.<sup>6,17,18</sup> The gold standard of treatment includes hydroquinone with broad spectrum photoprotection, but a variety of therapies have been used. In efforts to stunt the growth of melanocytes, inhibit the formation of melanosomes and increase their destruction, several therapies have included topical retinoids, azaleic acid, kojic acid, chemical peels, tranexamic acid, mequinol, melatonin, glutathione, cysteamine, flutamide, methimazole, polypodium leucotomos, and a multitude of lasers.<sup>1,16,19,20</sup> Tranexamic acid is a fibrinolytic agent that effectively treats melasma with downstream effects that impede melanin synthesis, decrease mast cells, and inhibit angiogenesis.<sup>1</sup> Lasers have shown benefit in improving melasma and can be implemented as a treatment option for patients who have not responded to topical or oral therapy. Fractional resurfacing is FDA approved for melasma and patients treated with this have shown improvement.<sup>21</sup> Intense pulse light (IPL) therapy has also been beneficial for the hyperpigmentation and vascular component associated with melasma.<sup>7</sup> Copper bromide lasers have been useful in treating melasma, especially in patients with increased vascularity.<sup>21</sup>

Despite the variety of treatment options, treating melasma presents a unique challenge that is often chronic and relapsing.

### Quality of Life Scales and Discussion

Although the weight that patients with melasma carry cannot be measured by the same traditional physical endpoints as other chronic diseases such as diabetes or cardiac disease, the psychosocial effects are undeniable. Melasma is a highly visible skin condition that has been shown to negatively impact a patient's quality of life (QoL), similar to acne.<sup>1,2,4</sup> This pigmentation disorder is a chronic condition that occurs in a relatively young population. Patients with melasma report feelings of frustration, embarrassment, and depression stemming from the presence of their melasma.<sup>1,22</sup> This chronic pigmen-

tion condition is sometimes dismissed as simply a cosmetic concern while other skin conditions such as psoriasis are not. One commentary even suggests that inadequate treatment of psoriasis should be considered a box warning, a spin on a term that the US Food and Drug Administration uses to highlight potentially harmful prescription medications.<sup>23</sup> When examining the effects that melasma has on QOL, a similar sensitivity of the psychosocial impact and disease burden should be given, as it typically affects the face which is harder to conceal than other parts of the body.

Several scales have been used to capture the QOL effects on various skin conditions including the Dermatology Life Quality Index (DLQI) and SKINDEX-16. Interestingly, a Singaporean study used the DLQI scale to compare the QOL effects from melasma to that of other skin conditions. The study results showed that the DLQI of melasma was lower than vitiligo, lichen planus, bullous pemphigoid, acne scarring, and pityriasis rosacea.<sup>24</sup> This data only further supports the need for a melasma specific QOL scale in order to truly capture the effects that melasma has on patients. Because the DLQI considers physical symptoms that are not relevant to pigmentary disorders, such as pain and pruritus, this comparison data that does not use a melasma specific scale can be misleading and potentially result in minimizing disease burden.

Given this need for a melasma specific QOL scale, Balkrishnan and colleagues created a Melasma QOL scale that consists of 10 questions to measure the QOL impact of melasma based on a Likert scale.<sup>2</sup> The MelasQOL was developed by modifying the SKINDEX-16 and using the melasma and discoloration questionnaire.<sup>4</sup> Balkrishnan et al conducted a survey on 102 women with melasma and found the life areas most impacted included social life, recreation and leisure, and emotional well-being.<sup>16</sup> The impact on a patient's emotional well-being can subsequently have a negative effect on social functioning, productivity at work or school, and lowered self-esteem.<sup>16</sup> Additionally when asked about their QOL in regard to work, family relationships, social life, sexual relationships, recreation and leisure, physical health, money matters, and emotional well-being, many patients felt that these areas in their life would improve if they did not have melasma.<sup>16</sup> Melasma is a chronic condition that can be extremely difficult to manage with expensive treatment options that are typically not 100% successful. Simply dismissing melasma as a cosmetic condition serves as a detriment to patients and discourages the quest for finding tailored therapy plans that can at least minimize the burden of disease for each patient.<sup>6</sup>

Pollo et al notes that currently only one specific QoL measure for melasma is available and points out that this scale did not follow the classic construction stages for psychometric instruments (it was constructed from previous questionnaires and

not the symbolic perceptions of the patient).<sup>25</sup> Furthermore, the original study reports that given the available study population demographics, information was not collected from ethnicities in which melasma is more prevalent.<sup>16</sup> The scale has since been translated and validated in additional languages including Spanish, Brazilian Portuguese, French, and Turkish but more work still remains to be done.<sup>26</sup> Specifically, melasma affects all skin types but occurs more commonly in darker skin types including East Asians (Japanese, Korean and Chinese), Indian, Pakistani, Middle Eastern, African, and Hispanic.<sup>6</sup> One study in Washington DC surveyed 2000 black patients and showed that pigmentary disorders other than vitiligo were the third most commonly cited skin disorders.<sup>27</sup> The most common problem among this subset of patients was post-inflammatory hyperpigmentation followed by melasma.<sup>6,27</sup> Another study reviewed medical records of patients in New York City and found dyschromia including post-inflammatory hyperpigmentation and melasma to be the second most common diagnosis in black patients at 19.9%.<sup>28</sup> Future health related QOL studies should include a diverse group of ethnicities in order to further elucidate the impact on QOL in the most commonly affected populations.

A recent pilot study by Jiang and colleagues notes that while studies have used MelasQOL to measure QOL in patients, not many studies have specifically measured the effect of melasma on self-esteem.<sup>29</sup> According to Pollo and colleagues, the current MelasQOL potentially compromised instrument precision by using a smaller number of questions to represent psychological effects of melasma as it relates to self-esteem compared to its impact on social relationships, leisure, profession, and physical appearance.<sup>30</sup> Having a scale that fully captures all of the QOL effects of melasma is not only important for clinical research, but it will serve as an asset to patients by validating the struggles that they endure regularly with this condition. Jiang et al suggests using a validated tool such as the Rosenberg scale (see Table 2) in a diverse population of patients with melasma.<sup>29</sup> Physicians often use physical changes in skin condition to objectively evaluate response to treatment; however, physicians should consider more than just physical changes when evaluating the efficacy of their treatment methods. Of note, melasma severity index (MASI) scores did not correlate with the negative effects on HRQOL, suggesting that even a small amount of melasma can be significantly distressing to the patient.<sup>16,29</sup> This only further emphasizes the need to enhance the MelasQOL to reflect these important factors.

Furthermore, updates made to the MelasQOL scale should include a response to treatment category. Pre and post therapy QoL must be assessed in clinical studies for melasma, especially considering that disease severity alone does not fully capture the concerns of the patient. One study noted an improvement in patients treated with serial glycolic acid peels every 3 weeks and 20% azaleic acid cream.<sup>31</sup> Another pilot study reported

**TABLE 1.**
**MelasQOL Disease-Specific Questionnaire for Assessing the Quality of Life of Patients With Melasma**

Answers: On a Likert scale of 1 (not bothered at all) to 7 (bothered all the time), the subject rates feelings on the following:

Regarding their melasma, patients rate how they feel about:

1. The appearance of your skin condition.
2. Frustration due to the appearance of your skin condition.
3. Embarrassment about the appearance of your skin condition.
4. Feeling depressed about your skin condition.
5. The effects of your skin condition on your interactions with others (e.g.: interactions with family, friends, close relationships etc.).
6. The effects of your skin condition on your desire to be with people 7.
7. Your skin condition making it hard to show affection.
8. Skin discoloration making you feel unattractive to others.
9. Skin discoloration making you feel less vital or productive.
10. Skin discoloration affecting your sense of freedom.

The total score ranges from 10 to 70

**TABLE 2.**
**Rosenberg Scale Self Esteem**

Answers: Strongly Agree, Agree, Disagree, Strongly Disagree

1. On the whole, I am satisfied with myself.
2. At times I think I am no good at all.
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I certainly feel useless at times.
7. I feel that I'm a person of worth, at least on an equal plane with others.
8. I wish I could have more respect for myself.
9. All in all, I am inclined to feel that I am a failure.
10. I take a positive attitude toward myself.

patients had an improvement in QOL and more willingness to be in social situations, participate in outdoor activities, have a more positive outlook on life, and have an increase in self confidence after successful treatment with oral tranexamic acid and triple combination cream.<sup>29</sup> Although there is no perfect "cure," making an improvement is enough to make the patient feel significantly satisfied. In fact, Wilson et al found that subjects were significantly satisfied with approximately 50% improvement in facial hyperpigmentation and melasma after treatment with a 1927 nm diode laser with and without topical hydroquinone.<sup>32</sup> This further emphasizes the idea that offering patients something has a positive effect on QOL versus doing nothing, which can feel discouraging and hopeless.

Finally, while it may be best to distinguish from the QoL scale, willingness to pay is another important measure of disease burden that should be considered in future melasma clinical studies.<sup>33</sup> A study conducted in Germany on patients with rosacea found that 25.7% would pay €100 (\$130) for a sustainable cure, 27.1% would pay €500 (\$650), 21.4% would pay up to €1000 (\$1300), and 19% would pay greater than or equal to €1000 (\$1300).<sup>33</sup> Since data shows that even a small amount of melasma may be significantly distressing to a patient, willingness to pay may be another important tool combined with QOL and self-esteem assessment used to further assess the importance of adequately treating these patients.

## CONCLUSION

Overall, melasma presents as a unique chronic and often recurring pigment disorder that mostly commonly affects women of dark skin types. This condition has a significant impact on QOL and self-esteem in ways that may not be fully captured by the 2003 MelasQOL assessment tool. Several enhancements to this assessment tool can be made in order to better serve patients suffering with this condition.

## DISCLOSURES

Dr. Fabi has conducted research studies and consulted for SkinMedica, Colorscience, Lumenis, and Solta. Dr. Goldman has conducted research studies and consulted for SkinMedica, SkinCeuticals, Isdin, Topix, Cell Research Corporation, Lumenis, and Solta. Dr. Kagha has no conflicts of interest to declare.

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